# Setting up N1MM logger with the microham MK2R+

# and Station Master

# at stations PA1M and PA1T

N1MM logger Version: 8.10.0
microHAM Router Version: 7.1.7

Last update: Oktober 5, 2008

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# 1 General information (setting up microHAM and N1MM logger)

In this document information is gathered about setting up the freeware contest program N1MM logger with the microHAM MK2R+ SO2R controller and Station Master banddecoder.

The original text from Joe, W4TV has been used as a start for this document and updated with texts from Pete, N4ZR his SO2R−only document. Also information from the N1MM and microHAM reflector are used and of course own trial and error.

This document has multiple sections. The information decribed is being used at the stations PA1T (Timon) and PA1M (Thomas). Choices have been made depending on the equipment used at these stations (PC, Radios etc). As an example: My PC has only 1 serial port so there is room for 7 virtual ports in uRouter in combination with N1MM logger. The shack PC at PA1T has 3 serial ports, so only 5 virtual ports are left to use and the LPT port is used.

I d like to thank all who have written about the MK2R+ in combination with N1MM logger. Especially I d like to thank Joe, W4TV and Pete, N4ZR for all information they have put on the web, reflectors and in personal e−mail to us. Thanks to Tom, N1MM for adding the microHam protocol to N1MM logger.

This information is placed on the web in the hope that it may help others in setting up the microHAM MK2R+ SO2R controller. The setup below is working for us but might not work at your place. The MK2R+ is a very complex hardware/software combination as it can be set up in so many different ways.

73 Thomas
PA1M

## 1.1 General information

### 1.1.1 Firmware updates and router versions

It is neccesary to have loaded the CORRECT firmware version for each version of Router. Each Router install file includes a firmware file. However, Router will only prompt for to load firmware if the installed version is OLD (reverting is not expected). Comparing the change logs for Router and the firmware for the MK2R, Router 7.1.5 requires firmware 4.2 Whenever firmware is changed, new "Power−up settings" must be saved to the interface (except USB II) and power must be cycled in order to properly initialize the controller in the interface. The firmware gets loaded to the interface − leaving the file on the computer does no good. Having a mismatch between firmware and Router will almost guarantee problems with PTT and switching.

Router tells the firmware of the MK2R at the bottom of the router Screen. Just before the Winkey rev.

### 1.1.2 Router software

The exe file (download) is the same for update or fresh install.

### 1.1.3 Info on the web (used in this guide)

Everything necessary to configure MK2R+ is in the manual:
http://www.microham.com/Downloads/MK2R_English_Manual.pdf
the same for the Station Master, a manual at:
http://www.microham.com/Downloads/SM_English_Manual.pdf
Support information from Joe : http://www.microham−usa.com/support.html
The MK2R+ setup Guide for N1MM (with LPT control):
http://www.microham.com/Downloads/MK2R_N1MM_Setup.pdf
and Pete's guide (with microHAM Protocol/USB control):
http://groups.yahoo.com/groups/N1MMLogger/files/USB−only%20SO2R.pd

# 1.2 MK2R+

## 1.2.1 Proposed Virtual Port numbers

Note: The absolute port numbers do not matter. The key is consistency − the same port number must be used for a specific function every time it is used. The port numbers below will be used (as proposed by Joe, W4TV).

| | |
|---|---|
| **COM 3 − WinKeyer** | (it is best to assign WinKey to the lowest port to avoid loss of CW if another port is activated for CW) |
| **COM 4 − Radio #1** | (PTT and Footswitch is optional on this port) |
| **COM 5 − Radio #2** | (PTT and Footswitch is optional on this port) |
| **COM 6 − Digital #1** | FSK and PTT for Radio #1 (assign Radio 1) |
| **COM 7 − Digital #2** | FSK and PTT for Radio #2 (assign Radio 2) |
| **COM 8 − MK2R** | Protocol port |

The porposed ports below are used at PA1M where PA1T does not have COM 3 and also uses the LPT port.

Ouch it's not working − please check
a.. Confirm that you have selected the correct soundcard for audio in N1MM and microHAM Router.
b.. Confirm that you have selected the correct wave file path in N1MM Logger.
c.. Confirm that you have the correct audio connections between microKEYER and the soundcard (all three cables).
d.. Double−check the preamp setting (jumpers) in the microKEYER (enabled for dynamic mic, bypassed for electret mic).
e.. Confirm that any wave files are being played back on the left channel of the soundcard (microKEYER uses left only).

a.. For debugging purposes it is very convenient to connect a set of powered computer speakers in parallel with the soundcard "Line Out" (microKEYER SOUNDCARD OUT jack).
b.. If you hear the proper audio but it doesn't reach the radio, the issue is in microKEYER's audio switching ...
c.. if you do not hear the right audio the issue is in the software (N1MM Logger or Windows).
d.. Refer to the Set−up Guide for microKEYER and N1MM Logger for Router configuration information and the N1MM Logger manual for N1MM configuration information.
e.. microKEYER/N1MM Set−up Guide is available through the "Download Documents" link in Router's "Help" menu.

**Q. Where are the MK2R settings stored**
A. Using Router version 5 and up: C:\Documents and Settings\All Users\Application Data\microHAM\cfg\

**Q. How to set up WYH on the MK2R**
A. When WYH is selected it simply switches the headphone feed to the USB Audio CODEC andrecords 'what you hear'. The audio settings selected by the RECORDING/DIGITAL LEFT/RIGHT controls are ignored. WYH is designed to be able to record 'what you hear'.

WYH is headphone audio and will be effected by the radio volume control.

**Q. How to setup SSB**
What kind of microphone are you using and how is it connected? You MUST set the jumpers correctly on the Live mic preamp based on the type of microphone and you must configure the soundcards correctly in Router.

If you can play a wave file via USB Voice CODEC, the CODEC driver is installed (it is built into Windows and not a microHAM driver). However, N1MM Logger REQUIRES that the Audio Settings tab (in N1MM Logger) is set up properly to select the correct inputs.

Further, if your computer has a motherboard soundcard that uses the RealTek HD audio chipset (or an add−in soundcard by SoundMax with the RealTek HD audio chipset), N1MM Logger will often

select the wrong input unless USB Voice CODEC is the Windows Default sound device (bad idea) because of issues with the non−standard RealTek driver.
Finally, MK2R+ MUST be in VOICE mode and the audio switching must be correct so that the microphone is switched to the sound card when you are recording ... there are three possibilities depending on whether you are trying to record on air or not and whether the logger activates PTT.

MK2R+ audio switching should be CmCmA or CmCmCm and you should not press the PTT while recording. Radio(s) must be in SSB mode and Router must know that (black box around the VOICE switching configuration).

**Q. My TX audio is not working anymore**
Uninstalling and reinstalling Router will not change a thing with the CODECs. You are wasting your time.

Confirm that the microphone is connected correctly, the proper microphone input (front or back) selected, the correct CODEC assigned to the Voice and Digital/Recording sides of Router, and the proper CODEC assigned in the audio switching.

It is very easy to overlook the subtle difference between Voice and Audio CODEC in both the Audio Switching tab and the Audio Mixer tab.

I would also confirm that Windows has not done something strange like install another audio device, or change the order in which the CODECs are installed. Click on the Get ID buttons and be sure that Wave IN ID = Wave Out ID = Mixer ID. Confirm that the "Soundcard name in the "Get ID" box is the one you expect (that it matches the selected soundcard).

**Q. TX Mic pull down does not offer "microphone" as a selection option. My laptop only has only mic in and line out.**
A. If the TX Mic select box on Router does not offer a microphone chose, the sound card does not support echoing the microphone to the speaker/headphone output and you will not be able to route the microphone through the laptop sound card or change DVK messages "on the fly."

You will still be able to record and playback messages with the N1MM Logger DVK but you will not be able to record while doing so. Configure your audio switching for ACA ... this connects the mic directly to the radio "at rest" and when the hand mic or footswitch is pressed and connects the DVK output to the radio when the computer PTT is active. When recording a wave file, do not press the hand mic PTT or footswitch.

**Q. I couldn't find an "Apply" button or similar.**
A. If you make a change, the change is applied immediately. If you want to save that change to the preset, use "Preset | Save As" to update (over write) the existing preset.
**Note**, you will probably want to set the VOICE/DIGITAL box on the Audio Switching TAB to "Use Voice Settings" for this weekend. Since TenTec does not include an AFSK mode in their radios/CAT command set, Router must determine Voice/Digital mode by operating frequency. By default operation between 7030 and 7045 is considered to be "DIGITAL" (AFSK).

Be sure to UNCHECK the "Mute mic on supported radios" box on the N1MM Logger Configurer "Other" tab. N1MM expects to run DVK via the AUX connector on the Orion. MK2R uses the mic input.

**Q. How can I record SSB− and/or CW−QSOs in N1MM with SO2R/1R−configuration and MK2R+?**
A. On CW, you can do it by selecting the USB Audio CODEC in N1MM's configurer|Audio tab. On SSB you have to choose between the N1MM DVK and recording, because the Audio tab in the configurer does not allow you to set a different soundcard for recording and DVK purposes

**Q. Function keys in SSB: Should I use the N1MM−DVK or the MK2R+ − DVK? Which is better?**
A. I would use the N1MM DVK because it allows for full integration between N1MM functions and the DVK, and use a separate recording application.

Q. Which sound card driver to select in Windows
A. Windows automatically selects any newly installed audio device as the default device for Sound Playback and Sound recording. This is undesirable as Windows Sounds would be played through MK2R+ and onto the air!

For Windows 2000 or Windows XP. right click on the Speaker Icon on the task bar and select "Adjust Audio Properties" or open "Sounds and Audio Devices" in Control Panel and reset the Default device for Sound Playback and Sound Recording to your computer's primary sound device.

For Windows Vista, right click on the Speaker Icon on the task bar and select "Playback Devices or open Sounds in Control Panel and reset the Default Playback device to your computer's primary sound device.

**Q. I'm missing some virtual serial ports, can't select them, can;t create them**
A. First try to delete all virtual ports from within router and create them again.
If this does not help remove all virtual ports from within Windows (System from within the Configuration screen), after deleting all ports they will be automatically created again (and hopefully also the lost ones). It worked here..

**Q. Do I have the Realtek sound card driver problem?**
A. Select "microHAM CODEC" in the Audio Mixer tab and click, "Get ID". If **Wave IN ID <> Wave Out ID <> Mixer ID** (ie. they do not have all the same number) you have the "Realtek problem" where the application is using the Mixer ID instead of the WAVE IN ID to select audio input.

Q. Using CAT and 2nd CAT ports
A. As two programs CAN NOT under any circumstances look at the same port simultaneously. That is the reason for the CAT and 2nd CAT ports in Router ... the primary logging/control program looks at the CAT port to control the radio and the secondary program (e.g., CW Skimmer, Spectravue, PowerSDR, etc.) looks at the 2nd CAT port for Icom "transceive" broadcasts, Kenwood IF data or slow speed (< 500 msec) polling with older Yaesu rigs to get the operating frequency for synchronization.

Q. Where are router's settings and presets stored?
Router's settings and presets are stored in the Windows registry. The stored settings are updated when Router is closed. Any "registry protection" or "registry backup/restore" program will prevent saving the settings (by restoring the previous state). In addition, if Router does not close properly, the settings will not be saved.

Q. How works the virtual serial ports
A. The Eltima virtual serial port is a software interface e.g., it provides software equivalents to the various buffers and registers of an 8250 compatible UART − for OEM specific hardware and software. For Router, the Eltima VSP code provides an interface compatible with the Microsoft Communications Toolbox. The data to/from the foreign applications is transferred to Router which reformats it into a microHAM proprietary multiplexed data stream (Radio_1 CAT, Radio_2 CAT, Control − which includes the various PTT, Footswitch, audio routing, and PC generated CW flags − and WinKey channels) and sends it via a DLL interface at 230Kbps through the USB port and the FTDI UART in the interface to the microcontroller in the specific interface.

The microcontroller then demultiplexes the data and distributes it to the appropriate process in the controller. CAT and WinKey data is put in standard ASCII form and handled by UARTS in the controller. The various control flags are acted on by the firmware to generate the necessary internal or external controls.

If Router and the microHAM interface are not running, the VSP should either not exist (Router not running) or return an error (interface not running).

Virtual ports created and defined by Router can only be used to communicate with or control devices that are attached to a microHAM interface. Just as with a "real" port, only one program at a time may open a virtual serial port and no two ports (virtual or real) may have the same address (COM number).

Q. MK2R+ and Vista
MK2R+ works with Vista. However, since Vista no longer allows an application (Router) to control the audio endpoints, it is more difficult to set−up. In effect, the user needs to use the Vista Volume Mixer to select each device/endpoint and set the level of that endpoint for each individual application (e.g., separate settings for Writelog, N1MM, WinTest, DX4Win, MMTTY, DXLab Suite, etc.).

Q. Reset MK2R/Microkeyer/Digikeyer settings

Save Power up settings to reinitialize the EEPROM in microKEYER, close Router to save the settings and then restart Router.

**FSK or CW messages**
PTT ON/OFF is not supported as an embedded command in the MK2R. Use the F10 key from the PS/2 keyboard.

RF problems with my MK2R
The bypass modification for the microKEYER II has not been evaluated for the MK2R+. However, due to the layout it will not be as simple as the microKEYER II version. Circuit grounds for the USB "core" and the balance of MK2R+ are separated and there is no conveniently located place for field installable bypasses.

# 1.3 N1MM logger

## 1.3.1 "PTT line" (usually RTS) on a serial port

One note with regard to N1MM Logger (and other logging/control software) ... DigiKeyer and other microHAM interfaces responds to the "PTT line" (usually RTS) on a serial port. The interfaces do not respond to "PTT via command."

In using N1MM with microHAM Router, it is best to set the PTT delay in N1MM slightly longer than the PTT Lead (microKEYER, microKEYER II, MK2R/MK2R+) or PTT Delay (DigiKeyer) parameter. N1MM Logger will begin producing audio (AFSK or Voice macro) when its delay time expires. If Router's PTT Lead/PTT Delay is longer, the transceiver will not have switched before N1MM Logger starts generating audio. A good starting point is to set N1MM Logger PTT delay to 20 msec and Router's PTT Delay to 10 msec. If the particular configuration does not require a delay for receive antenna switching (LNA PTT) and the logging/control program provides its own PTT delay (like N1MM), it is even possible to set Router's PTT delay to zero (0).

Always uncheck "PTT via command" when using microHAM Router. If "PTT via Command" is used, the PA PTT and/or LNA PTT outputs on the microHAM interface are not usable because Router and the keyer have no way of knowing that N1MM Logger has commanded the radio to begin transmitting.

The PTT delay setting in N1MM Logger and the PTT lead or PTT delay settings in microHAM Router should be adjusted for the particular installation. The PTT Lean/PTT Delay setting in Router should be less than the PTT delay in the logging program. Router's PTT Delay will control the delay between PA PTT/LNA PTT activation and the activation of the transceiver PTT. The logger PTT will control the delay between activation of PA PTT/LNA PTT and the start of RF.

If the PA relay was very slow one might set PTT delay in N1MM Logger at 40 mSec and set PTT Lead/Delay in Router at 30 mSec. In that case PA PTT would activate as soon as the operator pressed an F−key while the radio PTT would activate 30 mSec later and RF (audio/CW) would start 10 mSec after the transceiver PTT. With hand mic PTT, the amplifier would still receive its PTT command 30 mSec before the transceiver to allow time for the (slow) relay to switch and settle.

# 1.4 Station Master information

Quick Guide

- Connect iLink cables between MK2R and Station Master
- Check the "iLINK Couple" (frequency source) setting in Ports tab Station Master.
- On SM: Go to MENU mode (push MENU button for more than 1 second and Select *** CAT *** (SM will follow radio)

Relays Station Master (Rotator interface)
All of the relays in Station Master are Forward model N4100HS3DC12. The specification on the case says: 3A/125VAC/30VDC.

Although the Tailtwister is specified at 2.25A operating, remember that the starting surge will be

higher and there will be a substantial voltage "kick" on when the relays. The relays in the Station Master won't handle the currents required by the Tailtwister, so it was necessary to use some SPDT power relays with 20A contacts and 12V coils that I obtained at a local electronics surplus outlet to buffer the Station Master relays. The power relay NO contacts were simply wired across the CW, CCW and Brake switches in the Tailtwister control box. The SM Analog Input was taken directly from Terminal 3 of the control box and the Analog Ground was wired directly to Terminal 1 of the box.
Randy, W8FN

Trap alarms
Extend the "Report time" setting on the "Display" tab to the maximum and make "Alarm" the only Report selection for the bottom line.

Errors
KEY IN TOO LONG − Key IN can be found in Router on PA & Sequencer subtab from Antenna Switching& PTT sequencer in Station Master
Cahange the setting or deselect when not used. Dont forget to Store this information to the Station Master...

Antenna lock out between Station Masters.... NO
With two Station Master controllers, one unit does not know which antennas are selected by the other controller. There is no provision for sharing rotors between the units − but the firmware/software continues to evolve.

Resource sharing
Networked resource sharing of rotors, SteppIR antennas, etc. are features planned for Station Master Deluxe.

Rotor control
With the present software, rotor control is tied to selection of an antenna on the rotor. There are two "solutions" − first use a separate RS−232 interfaces rotor controller with the "auxiliary" port or second define all antennas as being on the rotor.
Antenna rotor resources are not shared among multiple Station Master controllers. The rotor control, SteppIR control and amplifier control are bound to the Station Master and transceiver to which it is connected. Antennas are shared using a Double Ten Switch with each Station Master controlling one "side" or set of outputs.

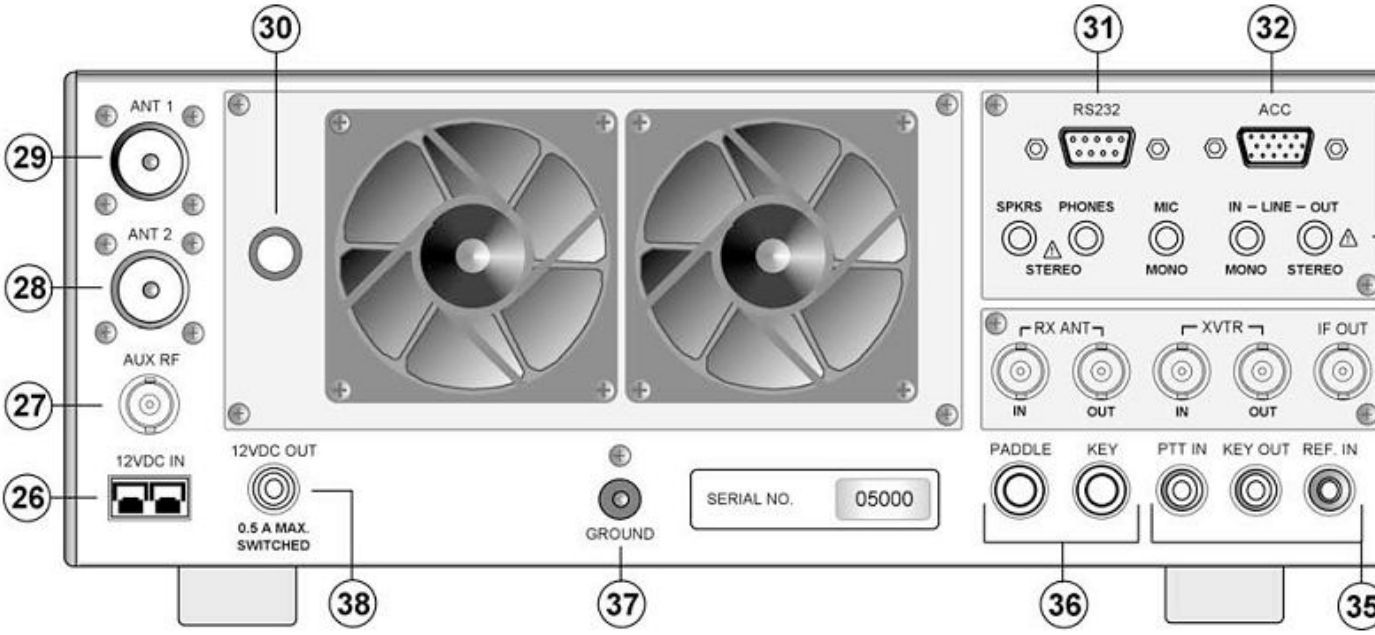
Stack switch
Station Master can interface with a stack switch by defining each configuration as a separate antenna. However, if you do that you will need to design an external relay network to switch the stack switch control lines between the two Station Master controllers so that the "active" Station Master is controlling the stack switch.

## 1.5 microKEYER (discontinued)

Audio connections

| microKEYER | computer |
|---|---|
| Soundcard OUT | Line Out |
| Soundcard IN | Line IN |
| Soundcard Mic | Mic IN |

## 1.6 Elecraft K3




No audio on line in

CAT noise : Buzzing sort of doo doot sound in the background of the record
This is CAT polling noise. The K3 has RF chokes in the ground leads of the RS−232 port, the ACC port and the mic return. This results in common mode noise if the ground ring of the Foster mic connector is not tight and the KIO3 board is not seated properly. The polling noise is particularly significant if the rear panel (3.2mm) mic input is used because there is NO chassis ground on that jack other than through the RF choke.

Check all your grounds! With the K3 it will help to add jumpers between the ground/common pins of the DB9 (RS−232 − pin 5), DB15HD (ACC − pins 5 & 12) and Foster (Mic − pins 7 and 8) connectors and the shell of the connector. This allows the "ground" currents to reach the chassis directly rather than see approximately 4 Ohms in the common leads.

## 1.7 Icom radios

CAT noise
With CAT noise in the Icom transceivers, check the ground connection on the "Remote" jack in the transceiver and on the shell of the "Remote" plug of the transceiver interface cable. There have been several reports in which the ground trace on the CAT (remote) has been opened. If the CAT return is open, CAT data will return through the ground lead of the ACC jack and can effect the "line" input which seems to be always on in Icom radios except the IC−7800.

## 1.8 Kenwood radios

No audio on SSB
With Kenwood radios you need to be aware of operating frequency and the "Digital Band Map." If the "Voice/Digital" box is set to "by frequency," audio and PTT settings will be set to either the Voice or FSK/Digital settings based on the operating frequency (Digital Band Map). In addition, most Kenwood transceivers require PTT_2 on digital (ACC jack audio input) and PTT_1 for Voice (Mic connector). Audio Routing C and A are appropriate with PTT_1. Audio Routing B generally requires PTT_2 which mutes the microphone.

## 1.9 All other Radios

CAT noise
The cat data reports are also more common among those users with non−Icom (dynamic)

microphones as they generally run much higher "mic gain" levels which increases sensitivity at the line in.

# 1.10 Realtek sound card drivers and MK2R+'s USB Voice CODEC

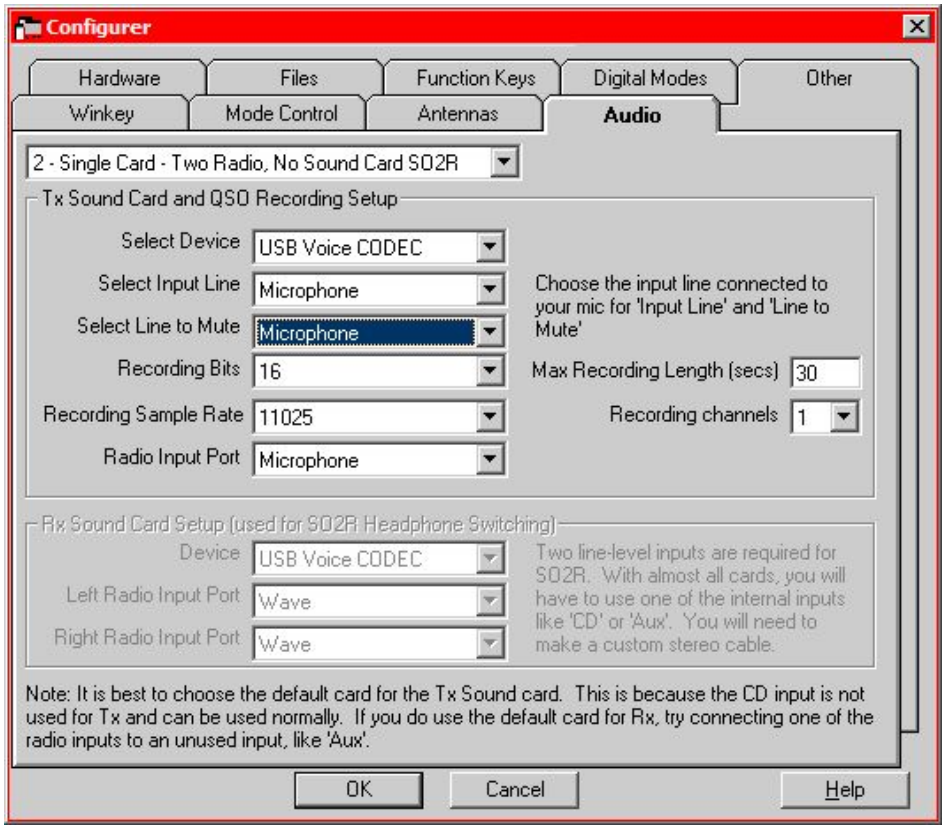
## 1.10.1 One soundcards installed (only Realtek)

This screenshot file explains how to get around a problem caused by some Realtek sound card drivers (used for Realtek and some Soundmax cards and onboard audio components) when trying to use the MK2R+'s USB Voice CODEC. I know this sounds nuts (after all, the MK2R+ uses its own sound cards, right?), but bear with me.

Certain sound cards and motherboard sound card components made by Realtek and Soundmax (which uses the Realtek drivers) prevent proper operation of features such as on−the−fly recording of DVK messages. There's a lot of magic here about ID numbers and such, but instead of getting into that, here are some easy step−by−step screenshots to get you going.

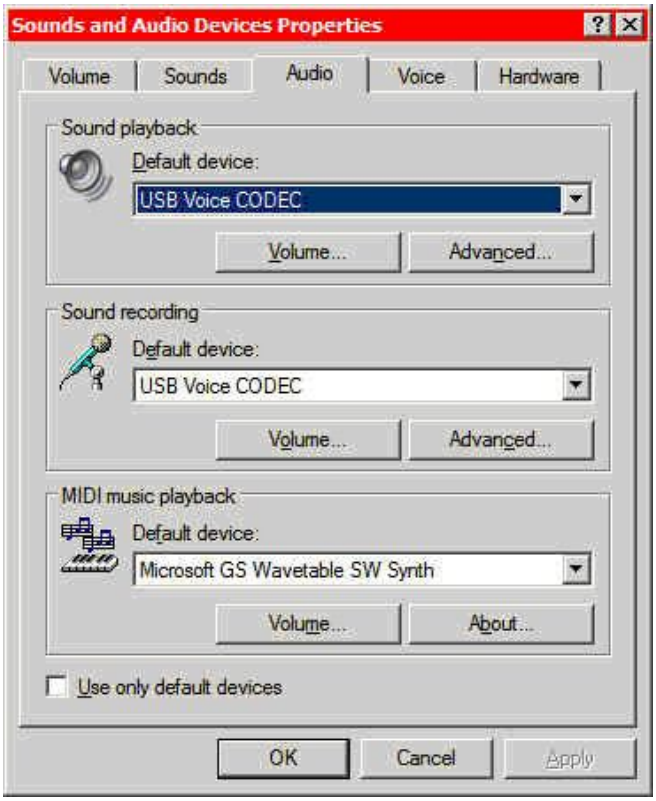
If you have this problem, the usual symptom is that N1MM will record an empty file when you try to record with Ctrl+Shift+Fx.

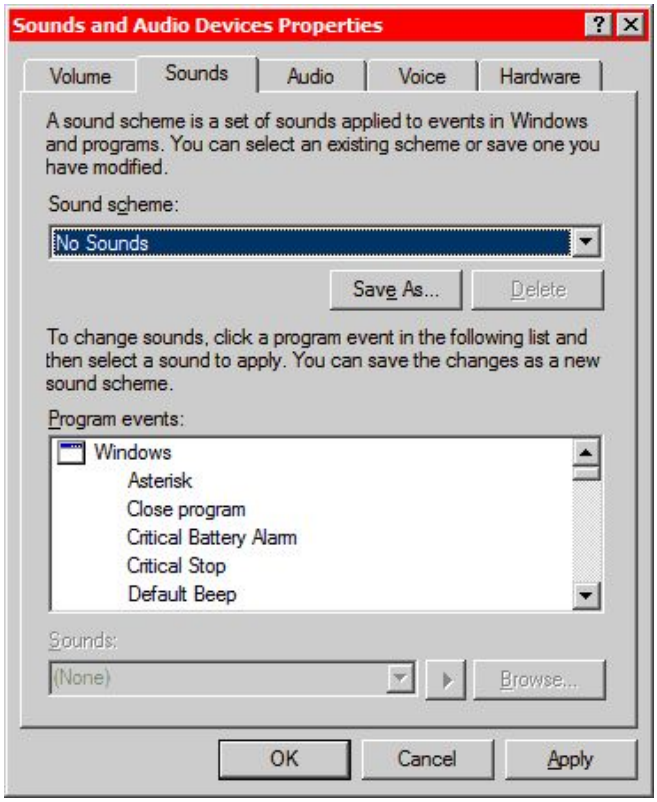
First, in N1MM logger, go to the Audio tab in Config|Ports,other


Configurer
Hardware
Files
Function Keys
Digital Modes
Other
Winkey
Mode Control
Antennas
Audio
2 - Single Card - Two Radio, No Sound Card SO2R
Tx Sound Card and QSO Recording Setup
Select Device
USB Voice CODEC
Select Input Line
Microphone
Select Line to Mute
Microphone
Choose the input line connected to your mic for 'Input Line' and 'Line to Mute'
Recording Bits
16
Max Recording Length (secs)
30
Recording Sample Rate
11025
Recording channels
1
Radio Input Port
Microphone
Rx Sound Card Setup (used for SO2R Headphone Switching)
Device
USB Voice CODEC
Left Radio Input Port
Wave
Right Radio Input Port
Wave
Two line-level inputs are required for SO2R. With almost all cards, you will have to use one of the internal inputs like 'CD' or 'Aux'. You will need to make a custom stereo cable.
Note: It is best to choose the default card for the Tx Sound card. This is because the CD input is not used for Tx and can be used normally. If you do use the default card for Rx, try connecting one of the radio inputs to an unused input, like 'Aux'.
OK
Cancel
Help

Select the USB Voice CODEC as the Device. The only inputs it has are Microphone. Don't worry about the Radio Input Port − N1MM can't currently record QSOs with the Audio CODEC anyhow. Just set it up like this.

Now open Windows Control Panel, and select the Sounds and Audio Devices tab.




Click on the Audio tab first. Set the USB Voice CODEC as the Default device for BOTH playback and Recording, and click Apply, then OK out. Now click the Sounds tab.

Normally, the Sound scheme will be identified as Windows Default, but if you leave it alone, the Windows sounds (like the File not found "clunk", for example) may wind up in your recordings or even go out over the air. To prevent that, you need to create a new scheme. Starting from the Windows default scheme you select each sound in turn from the Program events list, and assign "None" to it. Then save the resulting scheme under the No Sounds title. Apply it and OK out.

Now go back into the Router, and make sure that the Audio Switching tab has **CmCmCm** set for Voice, and that the left channel is selected for radio 1.

That's all there is to it. Now when you record DVK messages on the fly (by pressing Ctrl+Shift+Fx), your microphone audio will reach the Voice CODEC, and playback will work normally as well. Probably the best place to monitor your voice level is on the Audio Mixer tab of Router, in the left−hand bargraph. It has much more "resolution" than the simple indicator provided in the Info window of N1MM Logger. Enjoy!

73, Pete N4ZR

### 1.10.2 Ok I have the realtek problem

Depending on the software you are using to record the mic audio, Wave In ID <> Wave Out ID can be a real problem. You have set the default recording device to the microHAM CODEC and the default playback device to something else. The Mixer is still somewhereelse and most amateur software can not handle that condition.

### 1.10.3 Ok I have more than 3 mixers

The Windows XP mixer (SoundRec32.exe) only accepts mixers 0−3 on the command line (the way Router calls the TX or RX mixer). When you have at least four soundcards (five Mixers) in your system and microHAM CODEC is the fourth or fifth mixer, it can not becalled directly with the TX Mixer or RX Mixer button.

## 1.10.4 Two soundcards installed (disable Realtek and use the other..)

The issue with the RealTek HD Audio system is that RealTek creates two separate mixers: RealTek HD Audio Input and RealTek HD Audio Output.

Windows assigns the Audio Output as Mixer 0 (Windows Default) and Audio Input as Mixer 1. This results in a mismatch between the Wave In ID, Wave Out ID and Mixer ID for not only other soundcards but also the Wave Out device. For example a system with RealTek HD on the motherboard, Sound−Blaster Audigy 2 ZS, microHAM microKEYER II and microHAM MK2R+ looks like this under Windows XP (my own "testbed" system):

ID Wave Out Wave In Mixer
−−−

# 2 SO2R Setup at PA1M − microHAM MK2R+ and Station Masters and N1MM logger

Setup MK2R+ with Station Masters at little pistol SO2R station PA1M (Thomas).

This setup is for use at the station PA1M and for the hardware and software I use.
NB. This is a work in progress.

73' Thomas (pa1m@veron.nl)

Latest update: February 13, 2009

Back to menu.

NB. There is no lock out between Station Masters

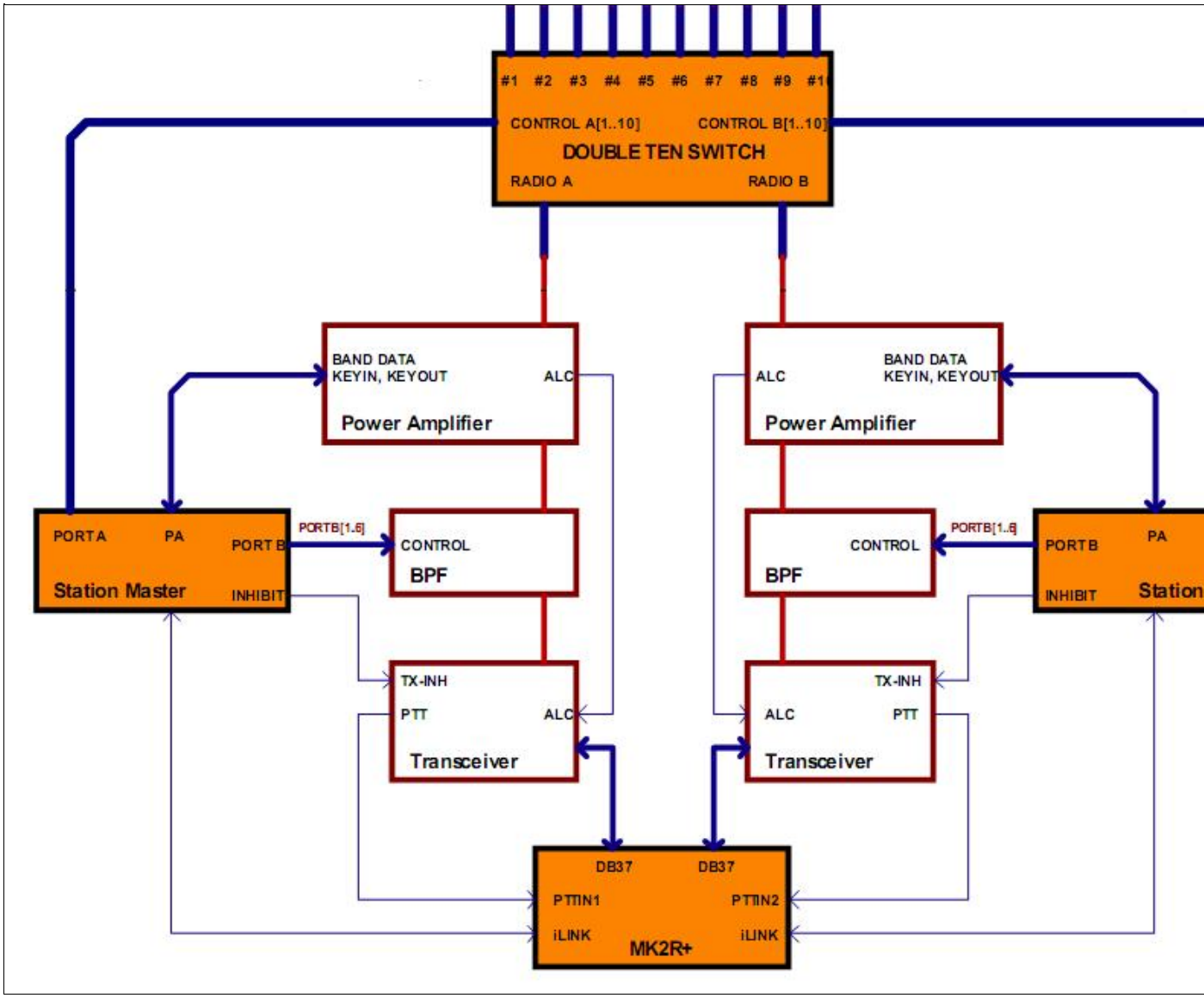
- USB Device Router prohibits transmitting on the same band
- It is however still possible to select the same antenna on different bands (multiband antenna)
  - ♦ When using a Double ten switch one radio will have an open relais... do not transmit!

| Station information PA1M | | | Port info | | Used for |
|---|---|---|---|---|---|
| **Radio 1** | Elecraft K3 | | **Com 1** | Real | |
| **Radio 2** | Kenwood TS−2000 | | **Com 2** | Virtual | |
| **Banddecoders** | Station Master (2) | | **Com 3** | Virtual | MK2R − WinKey |
| **Bandfilters** | ICE−419A (2) | | **Com 4** | Virtual | MK2R − Radio 1 |
| **Antenna switch** | microHam DOUBLE TEN switch | | **Com 5** | Virtual | MK2R − Radio 2 |
| **Antenna's** | few to Double Ten switch | | **Com 6** | Virtual | MK2R − PTT/FSK 1 |
| **Website** | − | | **Com 7** | Virtual | MK2R − PTT/FSK 2 |
| **Contest logger** | N1MM logger | | **Com 8** | Virtual | SO2R control |
| **PC shack** | Pentium−IV − 3 GHz 1 GB | | | | |
| **PC real LPT ports** | 1 (not used) | | | | |
| **PC real serial ports** | 1 (not used) | | | | |
| **Vitual serial ports** | 7 (partly used by MK2R+) | | | | |
| **PC LPT ports used** | 0 (not used) | | | | |
| **Realtek soundcard problem** | No | | | | |
| N1MM logger version | 8.9.1 | | | | |
| USB Device Router Version | 7.1.5 | | | | |

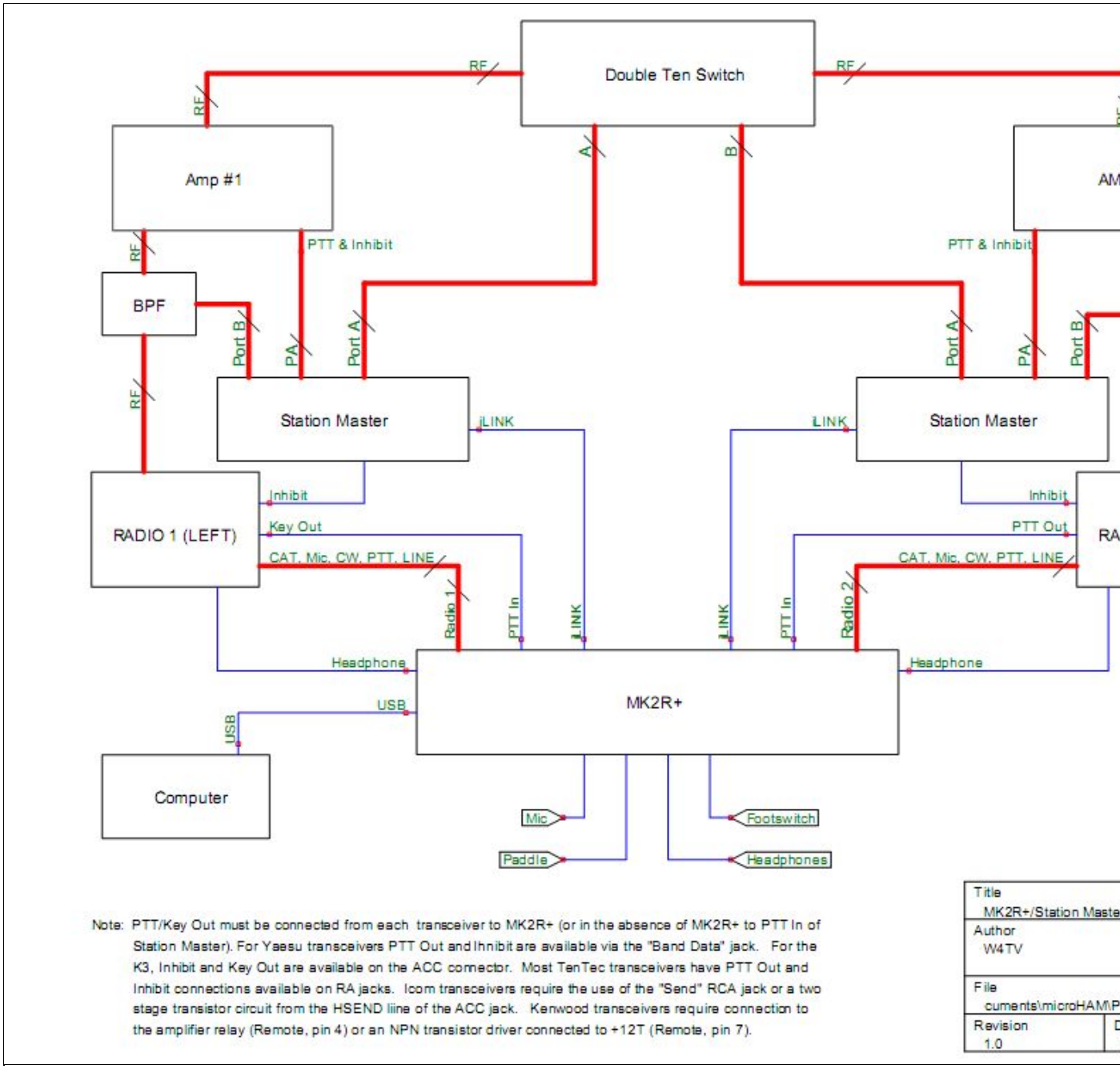
## 2.1 Layout cabling

### 2.1.1 MK2R+ Station Master Connection diagram (by Joe, W4TV)

Double click on the image to get a bigger picture.




Double click on the image to get a bigger picture.


Double Ten Switch
RF
Amp #1
A
B
PTT & Inhibit
BPF
Port B
PA
Port A
Station Master
iLINK
Inhibit
Key Out
CAT, Mic, CW, PTT, LINE
RADIO 1 (LEFT)
Radio 1
PTT In
Headphone
USB
MK2R+
Computer
Mic
Paddle
Footswitch
Headphones
Radio 2
PTT Out
Note: PTT/Key Out must be connected from each transceiver to MK2R+ (or in the absence of MK2R+ to PTT In of Station Master). For Yaesu transceivers PTT Out and Ihnibit are available via the "Band Data" jack. For the K3, Inhibit and Key Out are available on the ACC connector. Most TenTec transceivers have PTT Out and Inhibit connections available on RA jacks. Icom transceivers require the use of the "Send" RCA jack or a two stage transistor circuit from the HSEND liine of the ACC jack. Kenwood transceivers require connection to the amplifier relay (Remote, pin 4) or an NPN transistor driver connected to +12T (Remote, pin 7).
Title
MK2R+/Station Maste
Author
W4TV
File
cuments\microHAM\P
Revision
1.0

The "generic" diagram above shows the important connections. It does not show USB to the Station Masters or any of the optional controls (SteppIR, rotor, Antenna Tuner via CI−V, etc.).

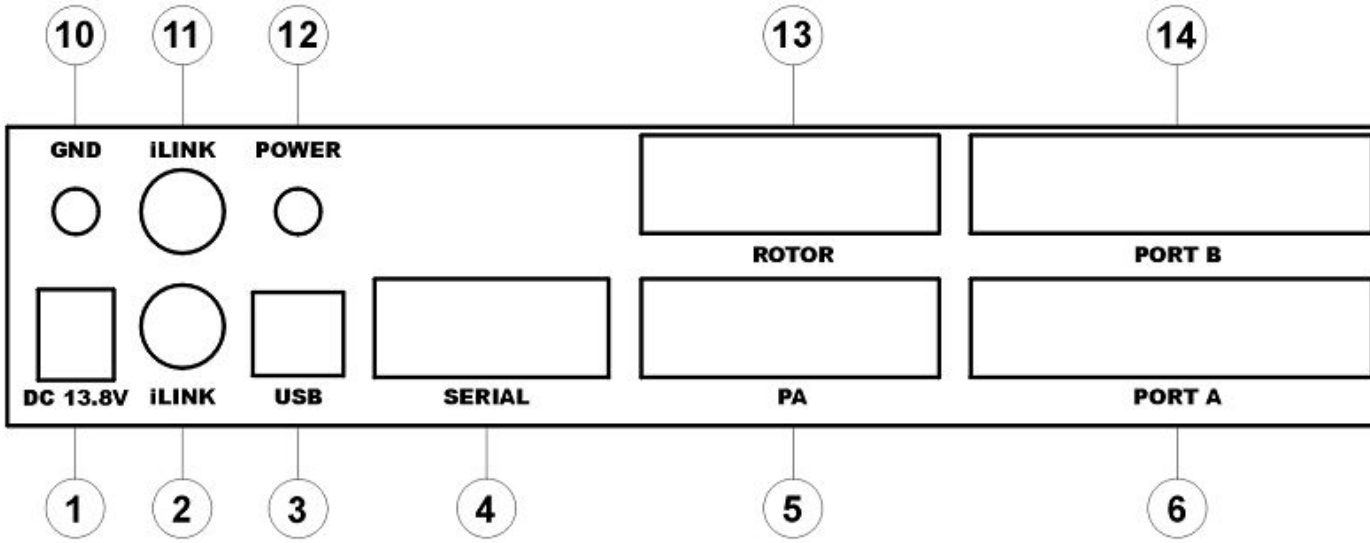
### 2.1.2 Shack PA1M

Layout cabling shack. Double click on the image to get a bigger picture.

.

The Inhibit line should be connected between Station Master and any Yaesu transceiver or K3. The transceiver PTT Out lines should connect to MK2R PTT In for each rig. These lines are important if there is the possibility of operation by VOX or "PTT by software command." PTT In is absolutely necessary if you are using receive only antennas.

### 2.1.3 Stationmaster




### 2.1.4 Nr 6 − Port A − Antennaswitch (DB25F) microHAM DOUBLE TEN SWITCH

Each Station Master has it's own cable to the Double ten switch and inside the switch connected each to one it's own "side" of connectors.
The antenna switch requires 12V to select an antenna (common ground). Controlled by Port A configured as voltage sourcing using internal power (default INT/SRC jumpers). (outputs A1−A10). Outputs A6−A10 are not used (yet).

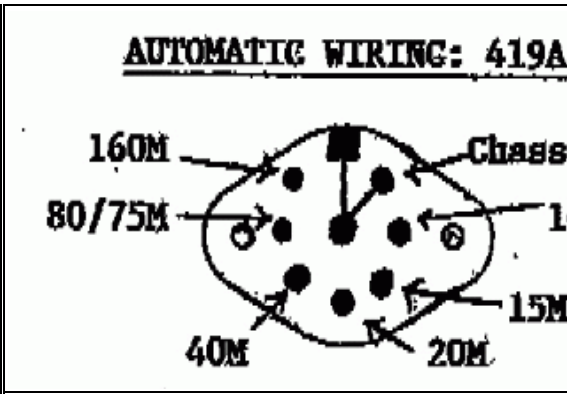
| StationMaster − Port A | DOUBLE TEN SWITCH |
|---|---|
| Pin 19 − CONTROL GND | Ground connecor |
| Pin 20 − A1 | Port 1 − Yagi 10−15−20 |
| Pin 21 − A2 | Port 2 − Vertical 40−80−160 |
| Pin 22 − A3 | Port 3 − Dipool 40−80−160 (using tuner) |
| Pin 23 − A4 | Port 4 − AV640 10−12−15−17−20−30−40 |
| Pin 24 − A5 | Port 5 − Active receive antenna (RX only) |
| Pin 25 − A6 | Port 6 − |
| Pin 10 − A7 | Port 7 − |
| Pin 11 − A8 | Port 8 − |
| Pin 12 − A9 | Port 9 − |
| Pin 13 − A10 | Port 10 − |

Cabling the Double−Ten switch to both Sttaion Master can be found at the bottom of this document.

### 2.1.5 Nr 14 − Port B − bandpassfilter, sequencer (DB25F) ICE−419A BPF

Band Pass filters (ICE419) requires switch closure to ground.
For proper BPF operation the PORT B jumpers must be set to INT/SNK (outputs B1−B6). This is not the default and should be changed inside the Station Master.
Outputs B7−B10 are not used (yet).

| SM − Port B | Wiring Color | ICE419A | View: staring at rear panel from behind |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Pin 19 − CONTROL GND<br>Pin 20 − B1<br>Pin 21 − B2<br>Pin 22 − B3<br>Pin 23 − B4<br>Pin 24 − B5 only( SM2<br>Pin 25 − B6 | Gray/Brown<br>Red<br>Yellow<br>Pink<br>Blue<br>White<br>Green | Chassis Ground ICE BPF<br>ICE 160 mtr<br>ICE 80 mtr<br>ICE 40 mtr<br>ICE 20 mtr<br>ICE 15 mtr<br>ICE 10 mtr |  |

Temporarily: Port B5 from SM 1 is broken, now using port B7: Connect Pin 4 to Pin 6 Pin 10 − B7 SM1

### 2.1.6 Nr 5 − Port PA − Power Amplifier (DB15F)

Tentec Titan: Has both a KEY IN (=PTT) and a KEY OUT (inhibit for QSK). Using the Key OUT has to be enabled in the Station Master PA & Sequencer Tab (INH).
Heathkit SB−220: Only has a PTT connector so only pin7 used from the Station Master. No inhibit signal used.

| SM − Port PA | Tentec Titan | SB−220 |
|---|---|---|
| Pin 6 − KEYIN<br>Pin 7 − KEYOUT | KEY OUT (lower one)<br>KEY IN (upper two) | −<br>PTT |

### 2.1.7 Nr 13 − Port ROTOR − Antenna Rotator (DB15F)

Maybe one day.

### 2.1.8 StationMaster cabling

Make sure you used the correct connections: pin 7 for "key out" (to the Key in or PTT jack of the Acom), pin 6 for "key in" (from the "key out" or "amp ready" jack on the Acom) and pins 13/14/15 for ground (shield of the two control lines).

Relays used in Station Master are: TOWRD N4100HS3DC12V 3A/125VAC/30VDC

### 2.1.9 Setup Station Master

Hold FUNC/MENU button: Select: *** CAT ***
Don't forget to set the jumpers inside!!

### 2.1.10 Setup uRouter

Ports tab: iLink couple: micro KEYER 2R+ (RADIO 1) for Radio 1 and micro KEYER 2R+ (RADIO 2) for Radio 2.
Antenna Switching & PTT Sequencer: Load from File and Store

## 2.2 DOUBLE TEN Port lockout with Station Masters

### 2.2.1 Solution 1 by Josef − OM7ZZ

For this soution to work the outputs with both contact poles avaliable (B7, B8, B9, B10) should not be used.
− Output from left SM port A1 connect also to B7−NO on righ SM.
− Output from left SM port A2 connect also to B8−NO on righ SM.

− Connect both B7−COM and B8−COM of right SM together and thru 1Kohm resistor to GND. Node point connect to KEYIN input of right SM (KEYIN, PA pin6).
− Do same from oposite side of view for left SM.

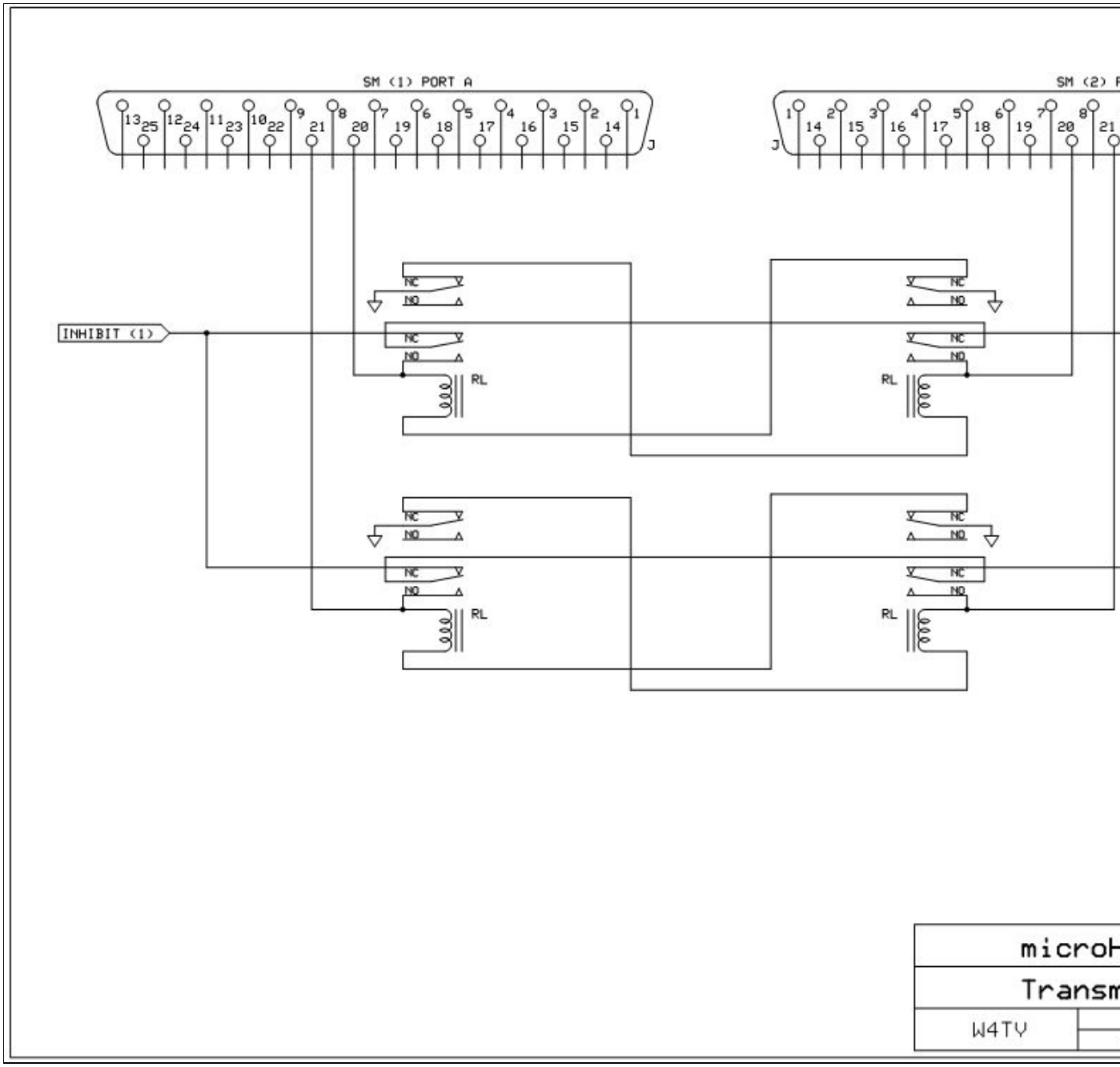
Configure both SM to activate:
− B7 together with A1
− B8 together with A2
− on PA & Sequencer tab check "Use Key In"

This way, KeyIn input locks TX on MK2R (thru iLink) if has high level on input. Normaly gets GND thru 1kohm resistor (TX enabled). When left SM activates A1, also activates B7 to which other pole is connected A1 from right SM. So far so good, other pole of B7 is floating, but when you switch A1 on right SM, right SM puts 12V on A1 which pass thru closed left B7 to its Keyin. Same right SM closes its B7 which is connected to A1 of left SM from where gets 12V to its Keyin. Result will be that if you select same antenna port on both SM, both radios will be locked. Same for second port (B2+B8), hope OK for you.

If you use (have connected) PA with KeyIn (Acom, Alpha etc ...), do not ground end of 1Kohm resistor, but connect it to amplifier's KEYOUT, it will be grounded thru PA.

Alternative solution
It is also possible to connect nodes with 1Kohm resistors to ACC port inputs on MK2R configured as INHIBIT inputs instead of SM Keyin, but in this case there must be serial resistors and 5V zeners to not pass 12V to MK2R ACC's TTL inputs. It will provides equivalent functionality.

### 2.2.2 Solution 2 by Joe − W4TV




The schematic above represents a partial schematic (only antennas 1 and 2) and not that the "Inhibit" connections are to "Key In" on the PA port.

The intent is to avoid using B7−B10 and to lockout transmit only on the 'second' radio. Remember only the application software can prevent selecting an already used antenna port − this simply prevents transmitting into an open feedline.

Using the situation of triband antennas on ports 1 and 2, the above circuit will prevent transmitting into an open port. There is nothing that will prevent one
radio from selecting a port that is already in use by the other radio. The diagram above will prevent transmitting with no antenna connected.

The transmit lockout uses an idea from Jozef (solution 1 above) (the Inhibit or Key In line) but uses a pair of external 12V DPDT relays to do the switching ... in this case, if one radio has selected a port that is "in use" it will be inhibited but it will not prevent the original radio from transmitting (e.g., run radio is on 20 meters using the tribander and the S&P radio selects the tribander on 15 meters the run radio continues to work because it was the first one there). This is a "first one wins" lockout. There is no need for a "double" lockout − that is handled automatically by MK2R if both radios are put on the

same band.

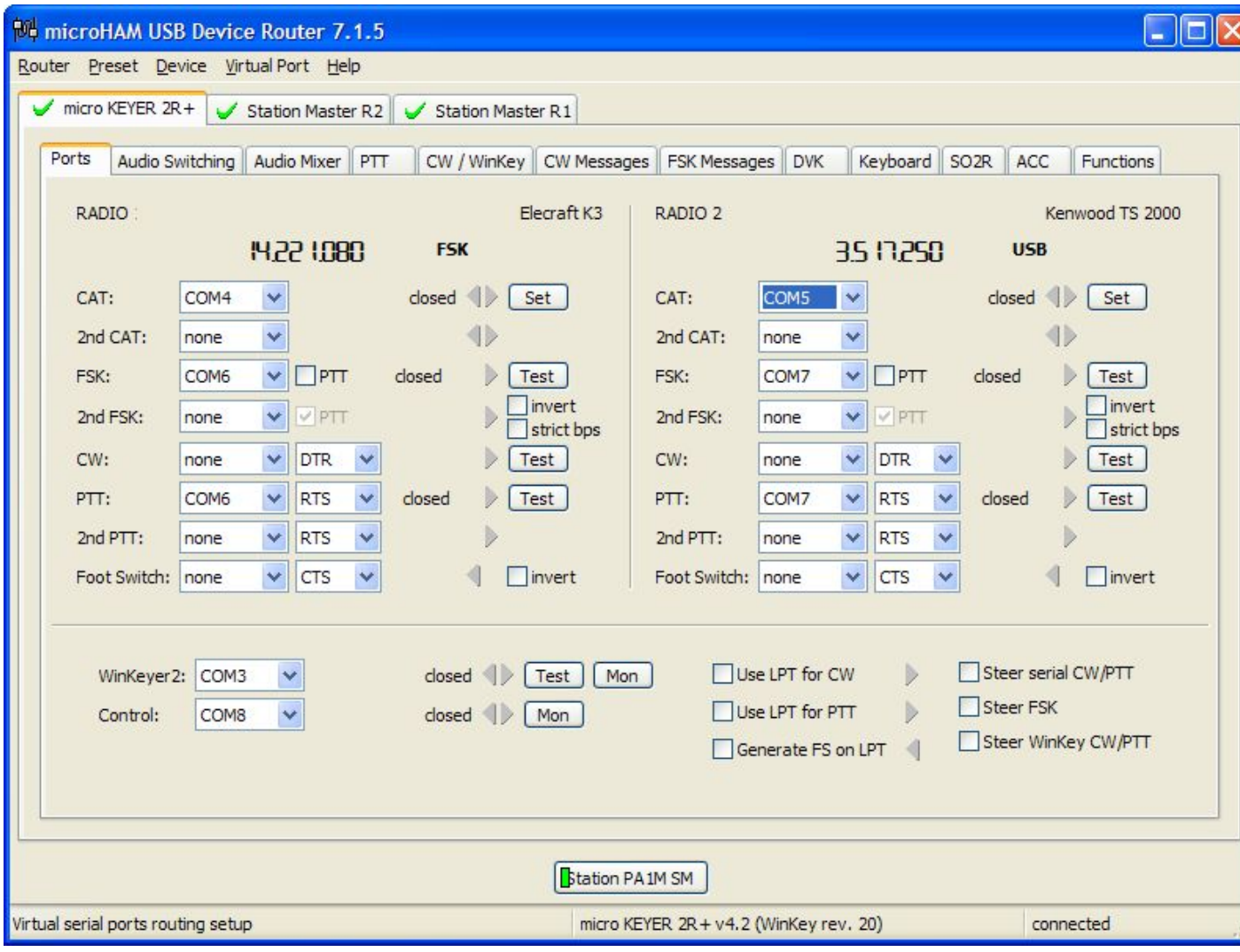
## 2.3 Radio settings

Proposed settings by microHAM:

| Kenwood TS−2000 | Elecraft K3 |
|---|---|
| • Menu nr.39 = INVERS<br>• Menu nr.50B = 5<br>• Menu nr.50C = 9<br>• Menu nr.50D = 9<br>• Turn OFF internal CW keyer in the radio | • LINE OUT − Nor 020<br>• PWR SET − PEr bAnd<br>• RS232 − 38400 b<br>• Select long DATA MD for FSK D per Band!! |

## 2.4 microHAM Router setup

**Tab: Ports**

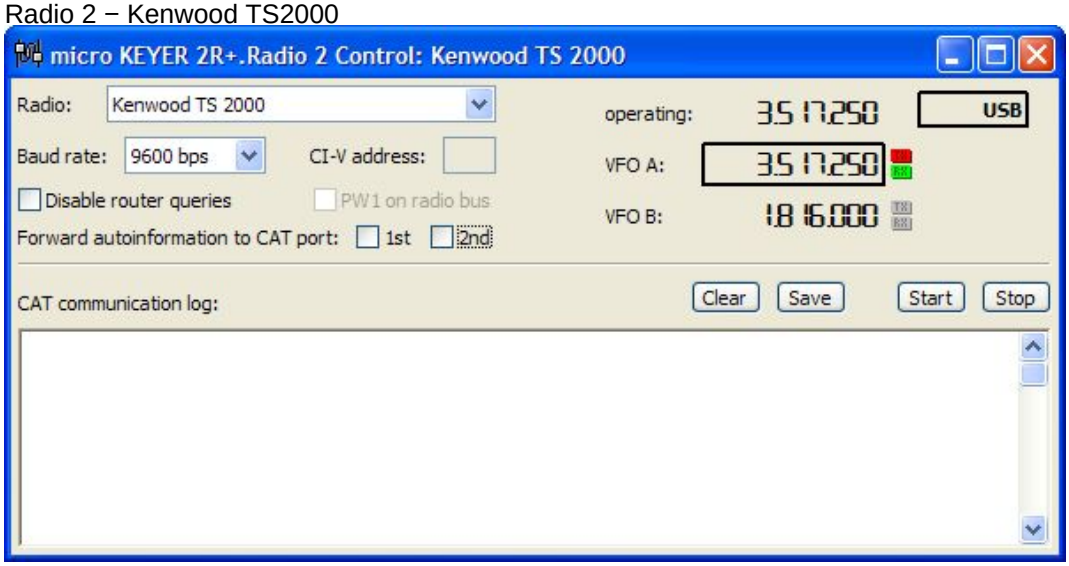



- **Radio:** Assign **Radio 1** to **COM4** and **Radio 2** to **COM5**
  - ♦ Click the **Set** button for each radio and select the radio on that port from the drop down box
    - ◊ Do not check the "Disable router queries" box (so empty them). With that checked, Router no longer polls the radio and the internal flow control does

not allow data to flow properly from the logger to the radio.
◊ PA1T: Check the "Forward autoinformation to CAT port" boxes with an Icom radio.
♦ Test: Check the radio by turning the VFO, frequency in uRouter should follow frequency radio.

Radio 1 − Elecraft K3

Radio 2 − Kenwood TS2000

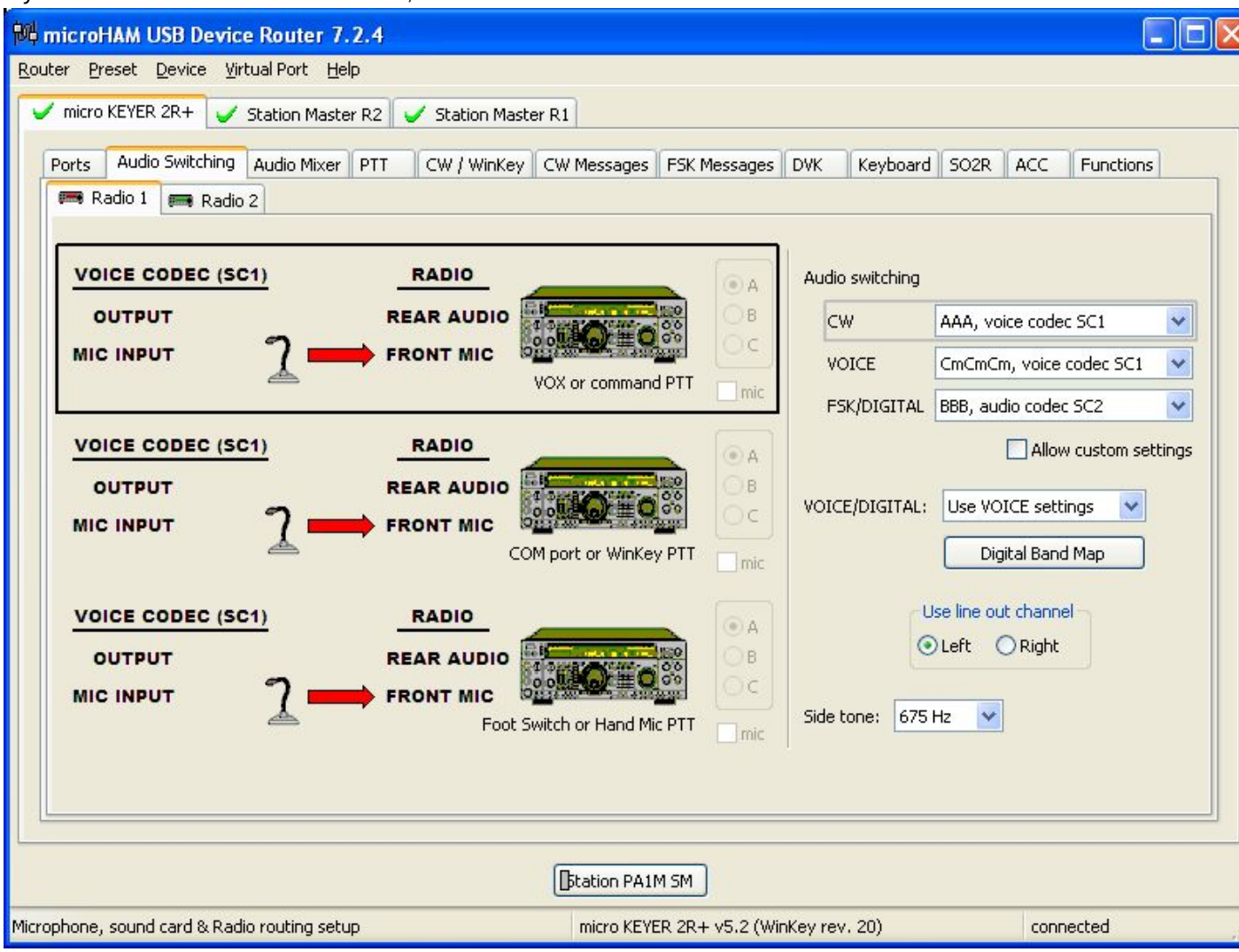



- **FSK:** Assign ports for FSK. **DI−1** to **COM6** and **DI−2** to **COM7** and **uncheck** the PTT box.
  - ♦ NB. If you are not using N1MM Logger for RTTY contesting you can skip this step.
  - ♦ If you are using the same port for PTT and FSK, uncheck the PTT box next to FSK.
  - ♦ Further down set PTT to the same port as FSK and select RTS.
  - ♦ Test: Test buttons sends FSK (MK2R: PTT: green; CW/FSK blinks green)
  - ♦ NB Don;t forget to set up the radio for FSK (K3 Select long DATA MD for FSK D per Band!!)
- **2nd FSK:** Not used
- **CW:** Not used
- **PTT:** Assign **PTT Radio 1** to **COM6** and **PTT Radio 2** to **COM7** and select **RTS** for both ports**.**
- **2nd PTT:** Not used
- **Foot switch:** Not used. Is output port to software, not supported by N1MM logger.
- **Winkeyer 2:** Assign **COM3**. Check Generate PTT1 on the CW/WinKey tab if you do not intend to operate QSK.
  - ♦ Test: Test buttons sends test in CW on radio 1 (MK2R: PTT: green; CW/FSK red in CW rhythm)
- **Control:** Assign **COM 8**

# Tab: Audio Switching

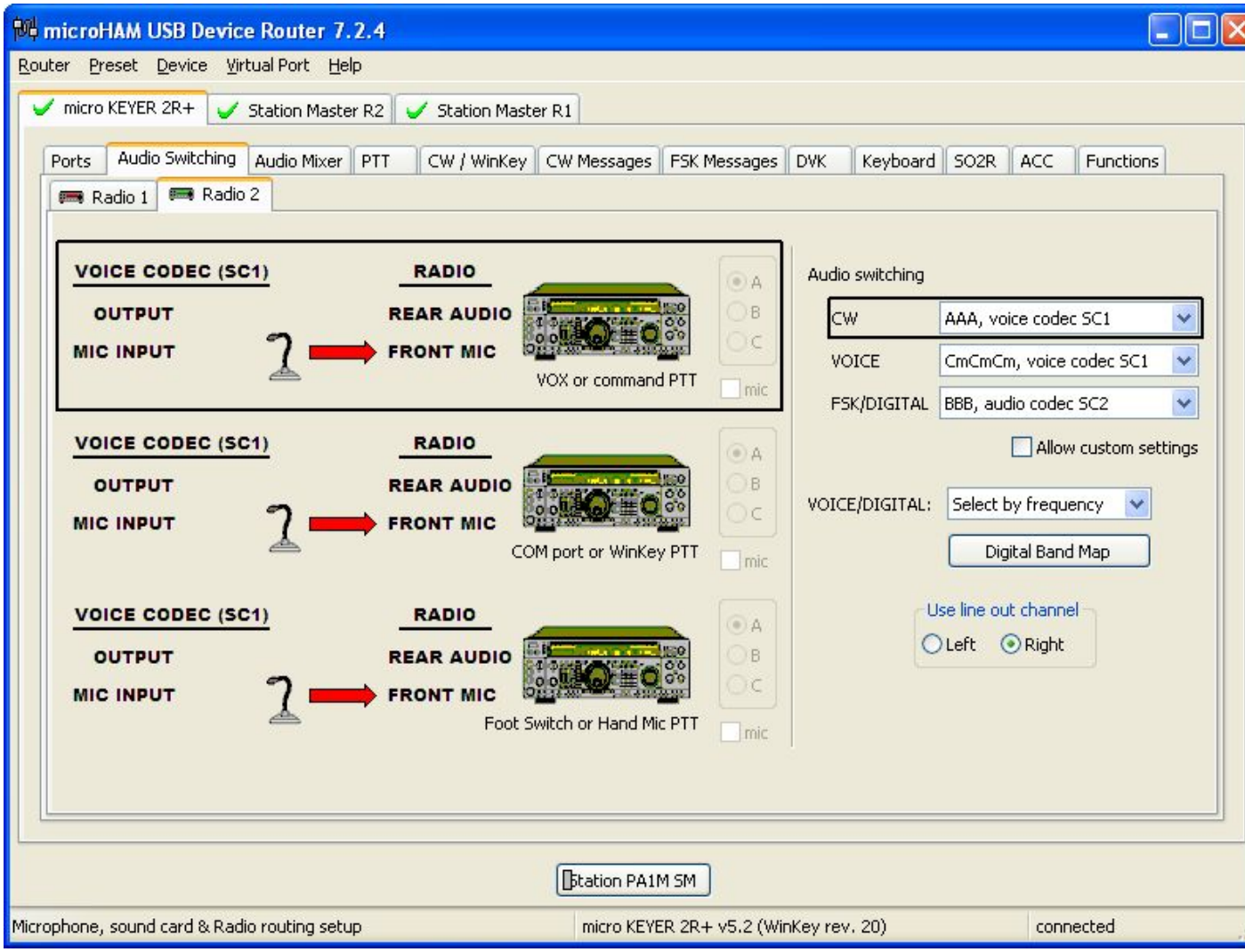
| Radio 1 – K3 | Radio 2 – TS-2000 |
|---|---|
| CW: **AAA** (always)<br>VOICE: **CmCmCm (mic in MK2R+)**<br>**CmCmA (mic in soundcard)**<br>FSK/DIGITAL: **?????**<br><br>VOICE/DIGITAL: **Select by frequency**<br>Use line out channel: **Left** | CW: **AAA** (always)<br>VOICE: **CmCmCm (mic in MK2R+)**<br>**CmCmA (mic in soundcard)**<br>FSK/DIGITAL: **BBB**<br><br>Use line out channel: **Right** |

If you do not intend to use N1MM DVK, use ACmA. **Radio 1:**




Voice/Digital for the K3 should be "Use VOICE settings" since the K3 has a separate digital mode that supports AFSK (AFSK A or DATA A).
Use line out channel: Left

**Radio 2:**

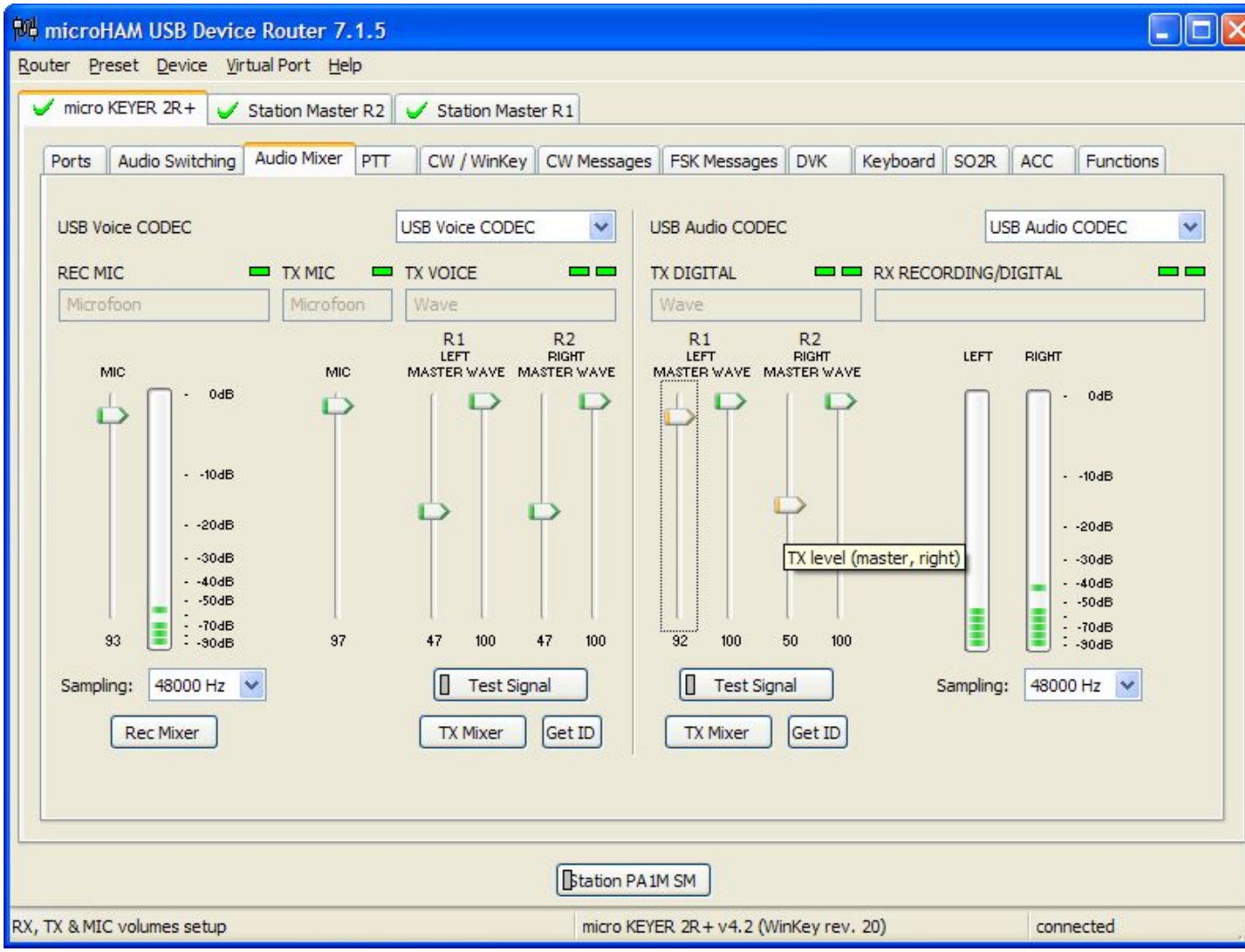



Voice/Digital for the TS−2000 should use "Select by frequency" since Kenwood does not support an AFSK mode.
Use line out channel: Right

## Tab: Audio Mixer

**Rules for audio playback are: Click on "get ID" in router's audio mixer tab. Make sure that WAVE IN ID == WAVE OUT ID == MIXER ID**. The N1MM Logger audio control cannot handle the situation where the Wave ID <> Mixer ID − it will send (or record as the case may be) audio from the wrong sound card. If the Wave and Mixer IDs are not the same,set the MicroHAM CODEC as the windows "default" sound card and confige N1MM Logger to use the default device.

The **soundcard name** displayed in the audio mixer selection box (**left half** of the Mixer tab in MK2R/MK2R+) must **match** that shown in **"Get ID"** and the **"Select Device" selection box in the N1MM Logger Audio tab**.



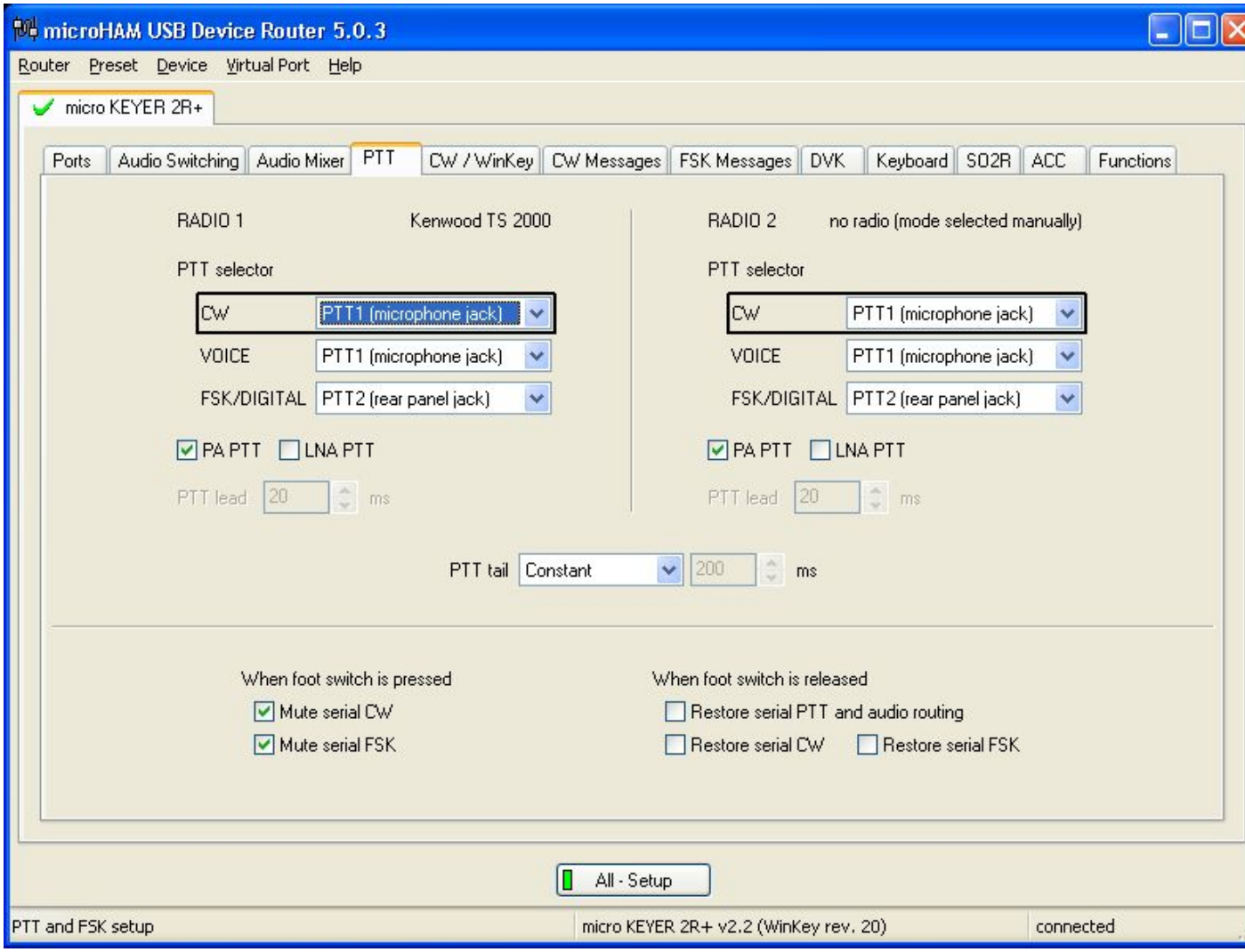

## Tab: PTT

| Radio 1 | Radio 2 |
|---|---|
| CW: **PTT1 (microphone jack)**<br>VOICE: **PTT1 (microphone jack)**<br>FSK/DIGITAL: **PTT2 (rear panel jack)**<br><br>PA PTT: **Select**<br>LNA PTT: **unselect**<br>CW in VOICE: ??? | CW: **PTT1 (microphone jack)**<br>VOICE: **PTT1 (microphone jack)**<br>FSK/DIGITAL: **PTT2 (rear panel jack)**<br><br>PA PTT: **Select**<br>LNA PTT: **unselect**<br>CW in VOICE: ??? |

For CW/VOICE select **PTT1 (microphone jack)** and for FSK/DIGITAL **PTT2 (rear panel jack).**
If you are using QSK in CW select QSK for CW.

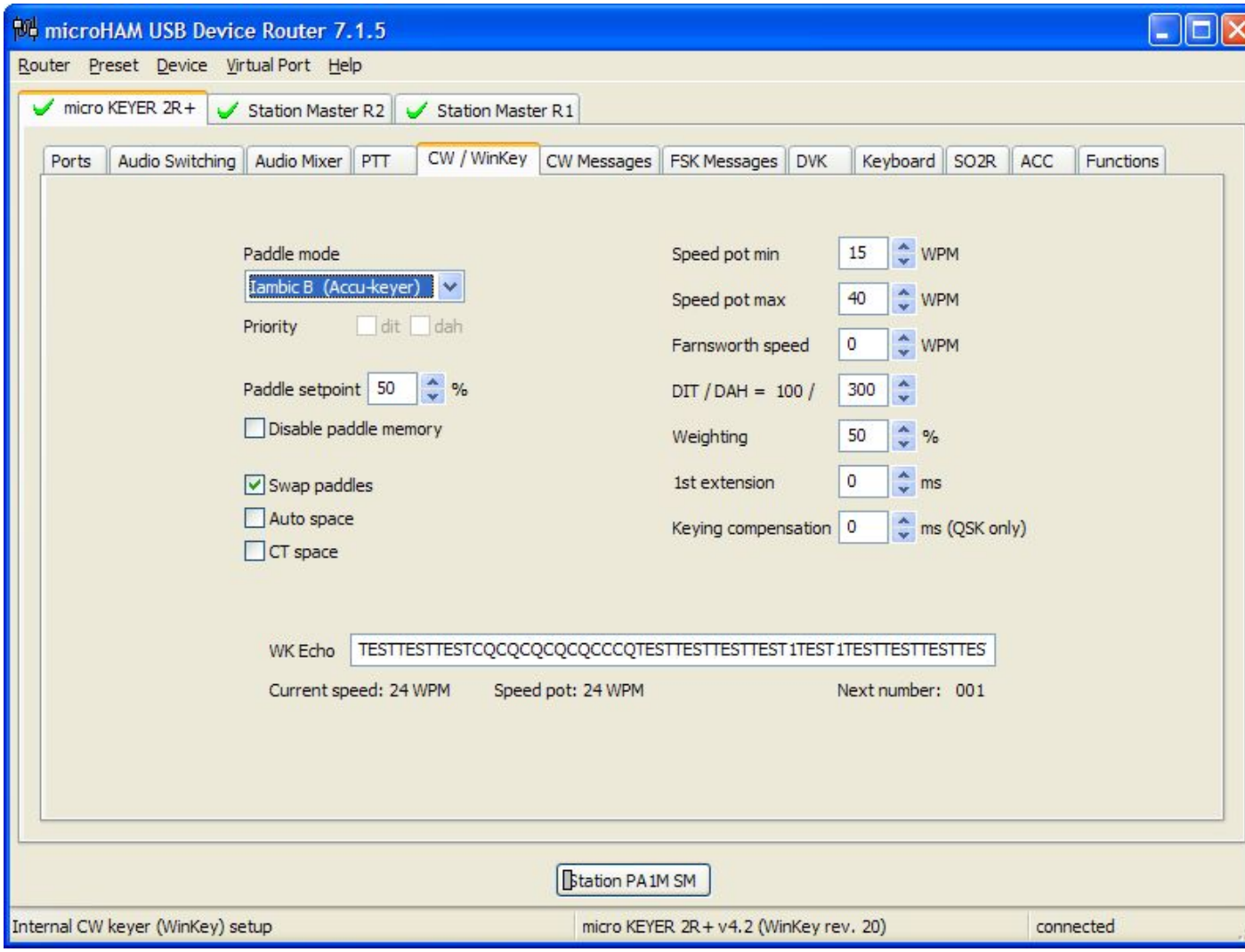
PTT Lead is the amount the transceiver PTT is delayed with respect to the PA PTT and should be about the same as the INH time in Station Master.
PTT Tail applies only to WinKey (it is the "hold" time between elements).

**NB** The K3 has only one PTT (Mic, rear panel and ACC are all the same line) so PTT1 (mic cable) and PTT2 (ACC plug) are the same to the K3.


microHAM USB Device Router 5.0.3
Router Preset Device Virtual Port Help
micro KEYER 2R+
Ports Audio Switching Audio Mixer PTT CW / WinKey CW Messages FSK Messages DVK Keyboard SO2R ACC Functions
RADIO 1 Kenwood TS 2000
PTT selector
CW PTT1 (microphone jack)
VOICE PTT1 (microphone jack)
FSK/DIGITAL PTT2 (rear panel jack)
PA PTT LNA PTT
PTT lead 20 ms
RADIO 2 no radio (mode selected manually)
PTT selector
CW PTT1 (microphone jack)
VOICE PTT1 (microphone jack)
FSK/DIGITAL PTT2 (rear panel jack)
PA PTT LNA PTT
PTT lead 20 ms
PTT tail Constant 200 ms
When foot switch is pressed
Mute serial CW
Mute serial FSK
When foot switch is released
Restore serial PTT and audio routing
Restore serial CW Restore serial FSK
All - Setup
PTT and FSK setup
micro KEYER 2R+ v2.2 (WinKey rev. 20)
connected

## Tab: CW/Winkey

Paddle mode: Iambic B (Accu keyer)
Swap paddles: **select**
No changes needed as all other settings under control by N1MM logger.




## Tab: CW messages

Not in use as the function keys in N1MM logger control the CW messages.
Test: test CW by pressing the Test button.

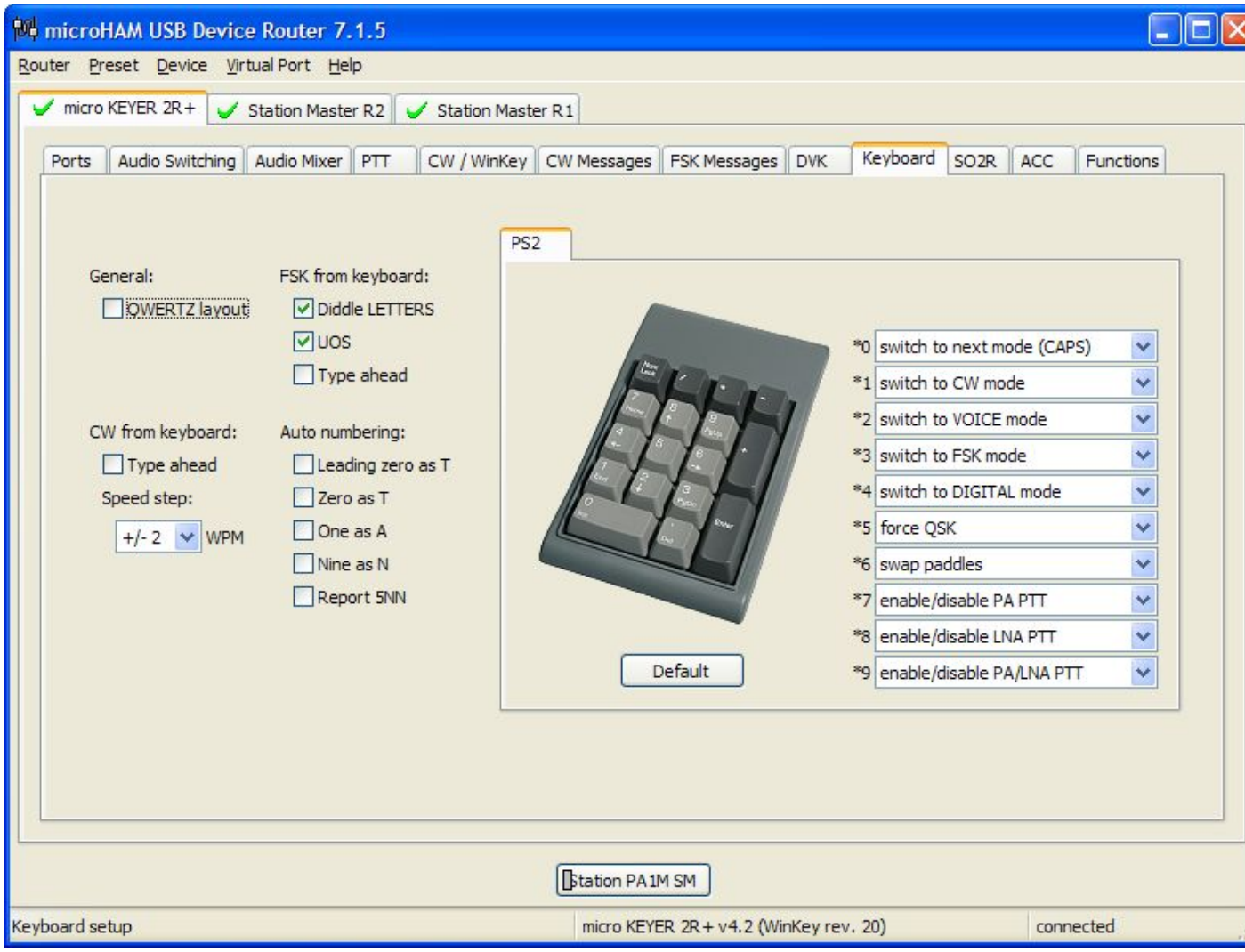
## Tab: FSK messages

Not in use as the function keys in N1MM logger control the FSK messages.

## Tab: DVK

Not in use as the function keys in N1MM logger control the Voice messages.

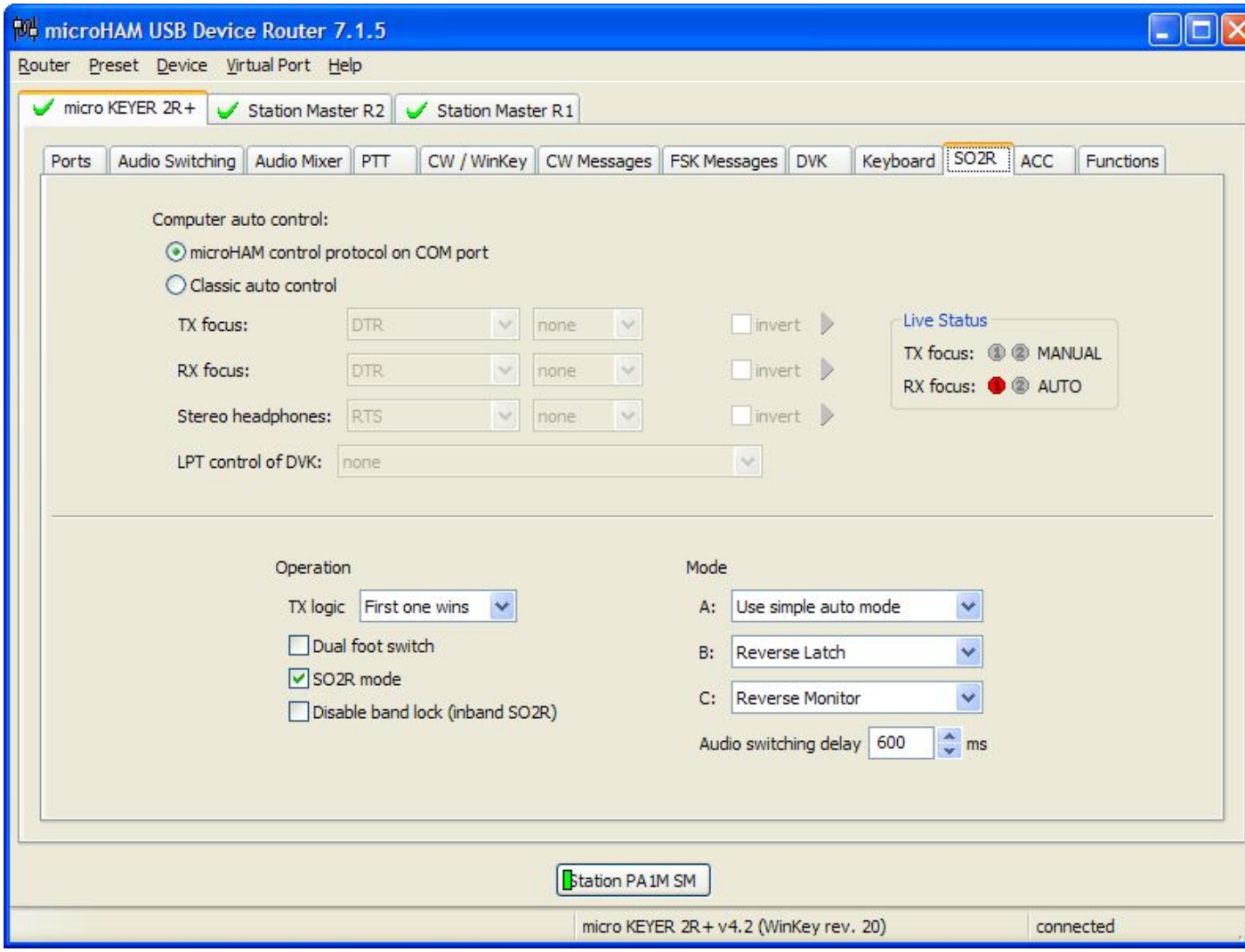
## Tab: Keyboard



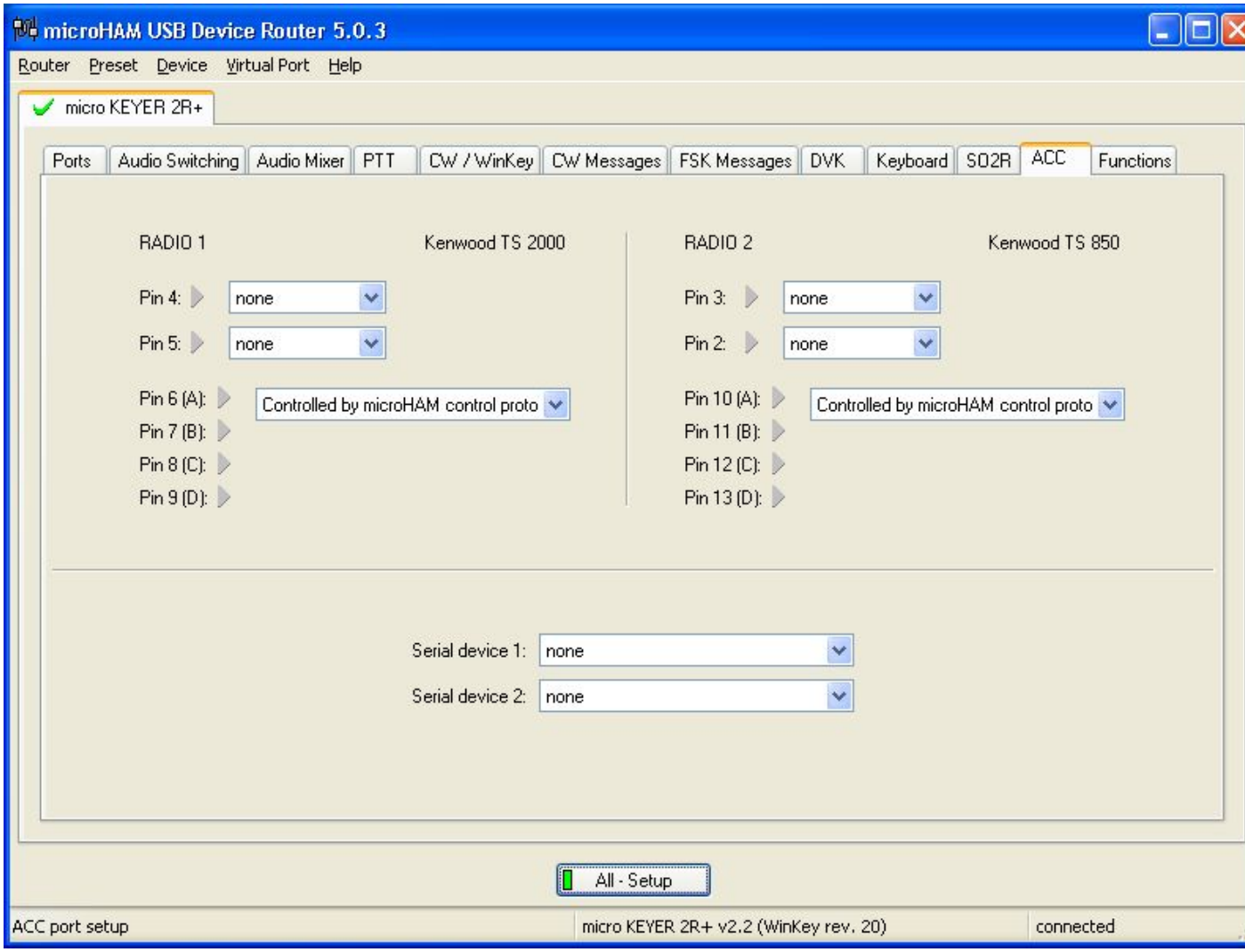

## Tab: SO2R

**Select** microHAM control protocol on COM port (NB com port is set on Ports tab) and 1 footswitch for both radios.

TX logic: **First one wins** ... is the correct logic for SO2R. It prevents transmission from starting on the second radio if the first radio is already transmitting.
These settings allow N1MM Logger to fully control both transmit and receive selection automatically. Stereo receive is commanded by the ` (backquote or unshifted tilde key) or the {STEREOON} and {STEREOOFF} macros.

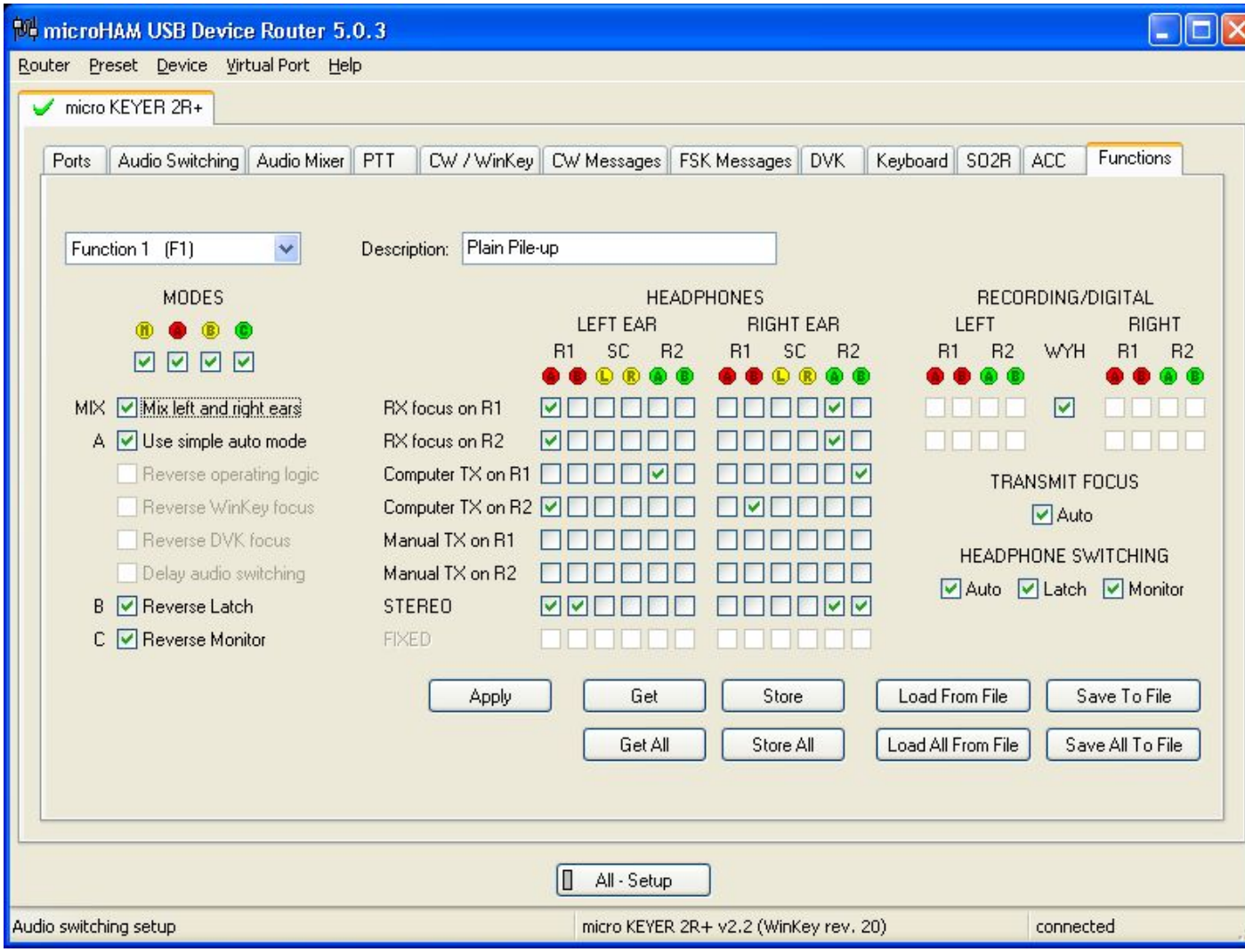

microHAM USB Device Router 7.1.5
Router Preset Device Virtual Port Help
micro KEYER 2R+
Station Master R2
Station Master R1
Ports
Audio Switching
Audio Mixer
PTT
CW / WinKey
CW Messages
FSK Messages
DVK
Keyboard
SO2R
ACC
Functions
Computer auto control:
microHAM control protocol on COM port
Classic auto control
TX focus:
RX focus:
Stereo headphones:
LPT control of DVK:
DTR
RTS
none
invert
Live Status
TX focus: MANUAL
RX focus: AUTO
Operation
TX logic
First one wins
Dual foot switch
SO2R mode
Disable band lock (inband SO2R)
Mode
A:
Use simple auto mode
B:
Reverse Latch
C:
Reverse Monitor
Audio switching delay
600
ms
Station PA1M SM
micro KEYER 2R+ v4.2 (WinKey rev. 20)
connected

## Tab: ACC


microHAM USB Device Router 5.0.3
Router Preset Device Virtual Port Help
micro KEYER 2R+
Ports Audio Switching Audio Mixer PTT CW / WinKey CW Messages FSK Messages DVK Keyboard SO2R ACC Functions
RADIO 1
Kenwood TS 2000
Pin 4: none
Pin 5: none
Pin 6 (A): Controlled by microHAM control proto
Pin 7 (B):
Pin 8 (C):
Pin 9 (D):
RADIO 2
Kenwood TS 850
Pin 3: none
Pin 2: none
Pin 10 (A): Controlled by microHAM control proto
Pin 11 (B):
Pin 12 (C):
Pin 13 (D):
Serial device 1: none
Serial device 2: none
All - Setup
ACC port setup
micro KEYER 2R+ v2.2 (WinKey rev. 20)
connected

Select **Controlled by microHAM control protocol** in the two drop−down boxes. Pins 6−9 and 10−13 are connected to two banddecoders which drive the microHAM 2by10 SO2R switch. Note that these precisely pass through the antenna selections from the N1MM Logger Antenna tab − so you can have multiple antennas on a given band, selectable from the keyboard.

## Tab: Functions




By Joe, W4TV: Using the "Functions" tab in Router, create the desired audio switching pattern. Check the Auto boxes for Transmit Focus, and Headphone Switching as well as Latch and Monitor.

From what you describe it would look something like this:
LEFT RIGHT
A B L R A B A B L R A B
RX on R1 X X
RX on R2 X X
C on R1 X X
C on R2 X X
TX on R1 X X
TX on R2 X X
STEREO X X X X
<FIXED>

Select a "Function" memory to store this configuration and click the "Store" button to write it to the MK2R. Then click the "Apply" button to make that function active or press the F # button on the MK2R front panel.
If you need to monitor sidetone when manually transmitting − e.g. to hear sidetone in CW, the Headphone settings would look something like this:

LEFT RIGHT
A B L R A B A B L R A B
RX on R1 X X
RX on R2 X X
C on R1 X X

C on R2 X X
TX on R1 X X
TX on R2 X X
STEREO X X X X
<FIXED>

Remember the "functions" tab is simply a graphical "matrix" editor. Anything you can create must be stored to a Function memory and recalled or applied to activate.

The "computer on R1/R2" options are only available if "Latch" is selected. The "TX on R1/R2" options are only available if "Monitor" is selected. The Stereo selections are an "override" that is applied only if the logging program issues a "Stereo" directive (e.g., LPT pin 9 in NA or the "Stereo" command from a program that supports the microHAM protocol). The "Fixed" settings are used only if the Auto box is not checked for Headphone Switching (the other seven lines are ignored).

By Pete, N4ZR: I wanted to be able to use N1MM s FocusOther function to control where the entry focus was when I was transmitting on one radio or the other. The greyed−out options for Computer TX on R1 and R2 get in the way of that. If you uncheck Latch in the Headphone Switching area, that disables those choices and lets N1MM be the boss.
Manual TX on R1/2: the ability to listen to sidetone when sending paddle CW = to hear sidetone in both ears when sending manually.

**Saving you work**
Save settings to a preset by selecting menu Preset | Save as. Choose a position and name it (example): **N1MM−all modes**.

Note: Each of the tabs is complex enough to warrant careful attention. Incidentally, it is always a good idea to save your last working setup as a Preset, so that you can retrieve the situation if you mess up. It also makes sense to save your experiments.

It is needed to leave router running as it's the spider in the web for our SO2R setup.

## 2.5 Station master setup

When the software is running (green tab), select the Station Master and update to the latest Station Master Firmware.

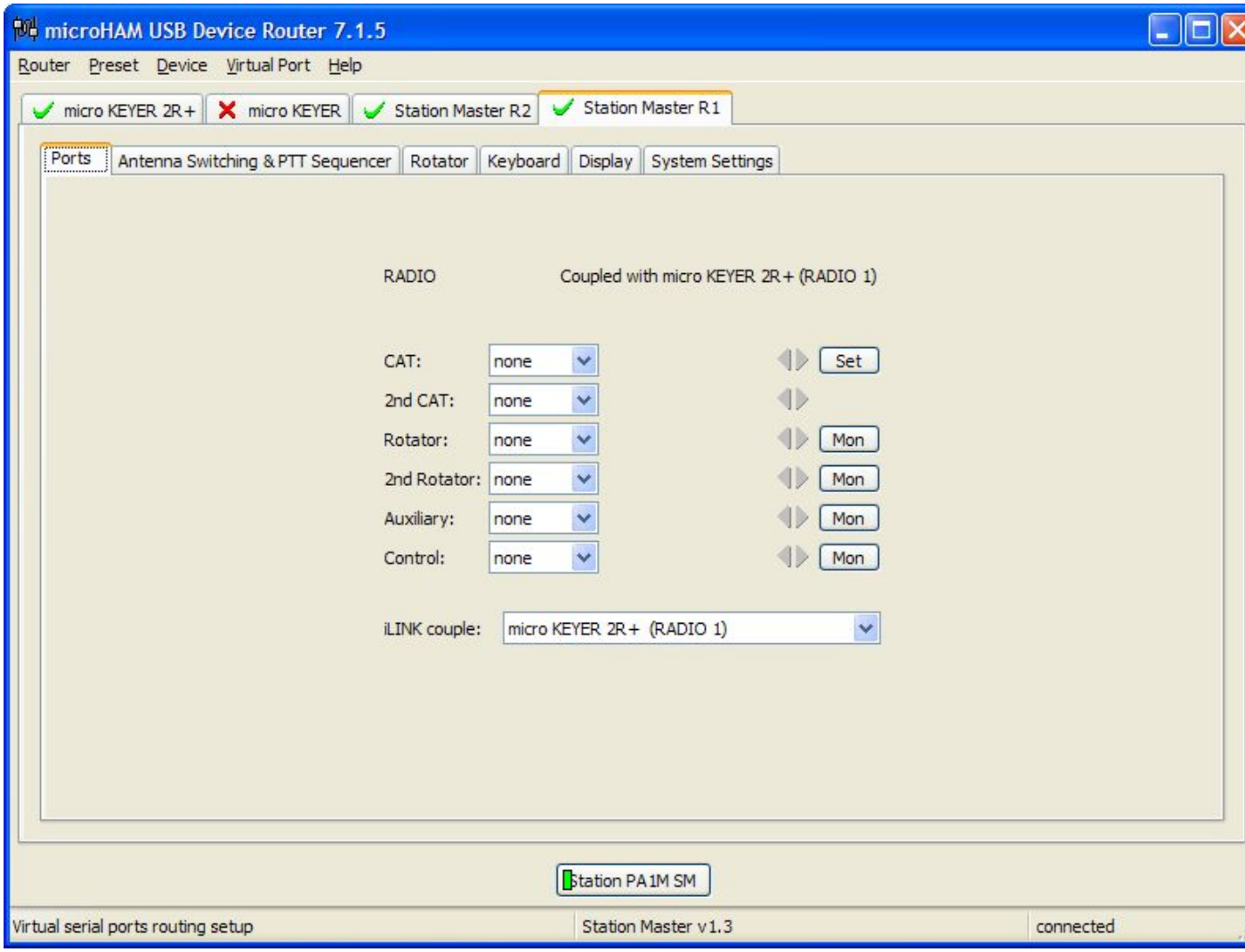
### 2.5.1 Settings Station Master (the box)

Go to MENU mode (push MENU button for more than 1 second

- Select *** CAT ***
  - ♦ From now on the Station Master will follow the Radio

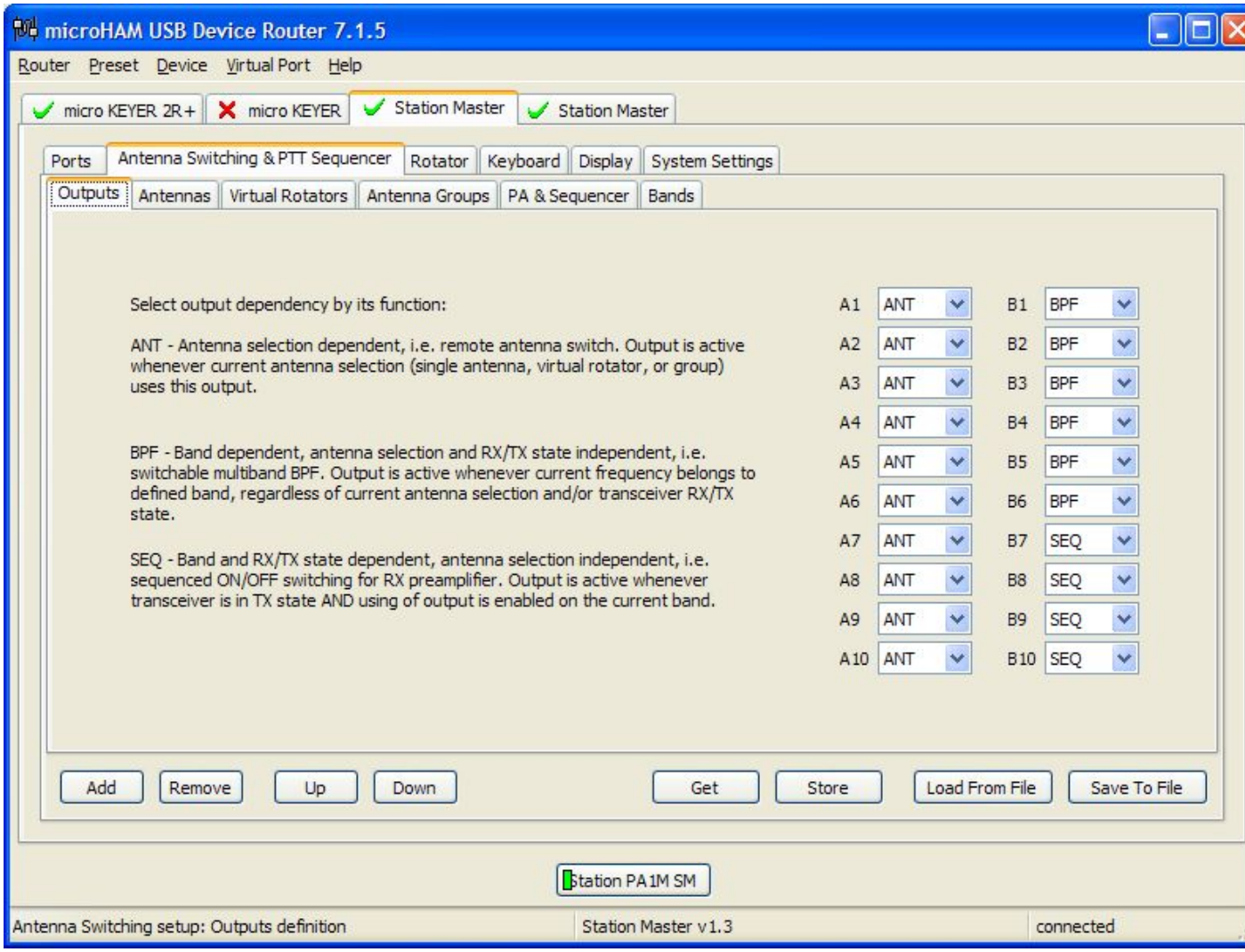
### 2.5.2 Settings Router (the software)

## Tab: Ports



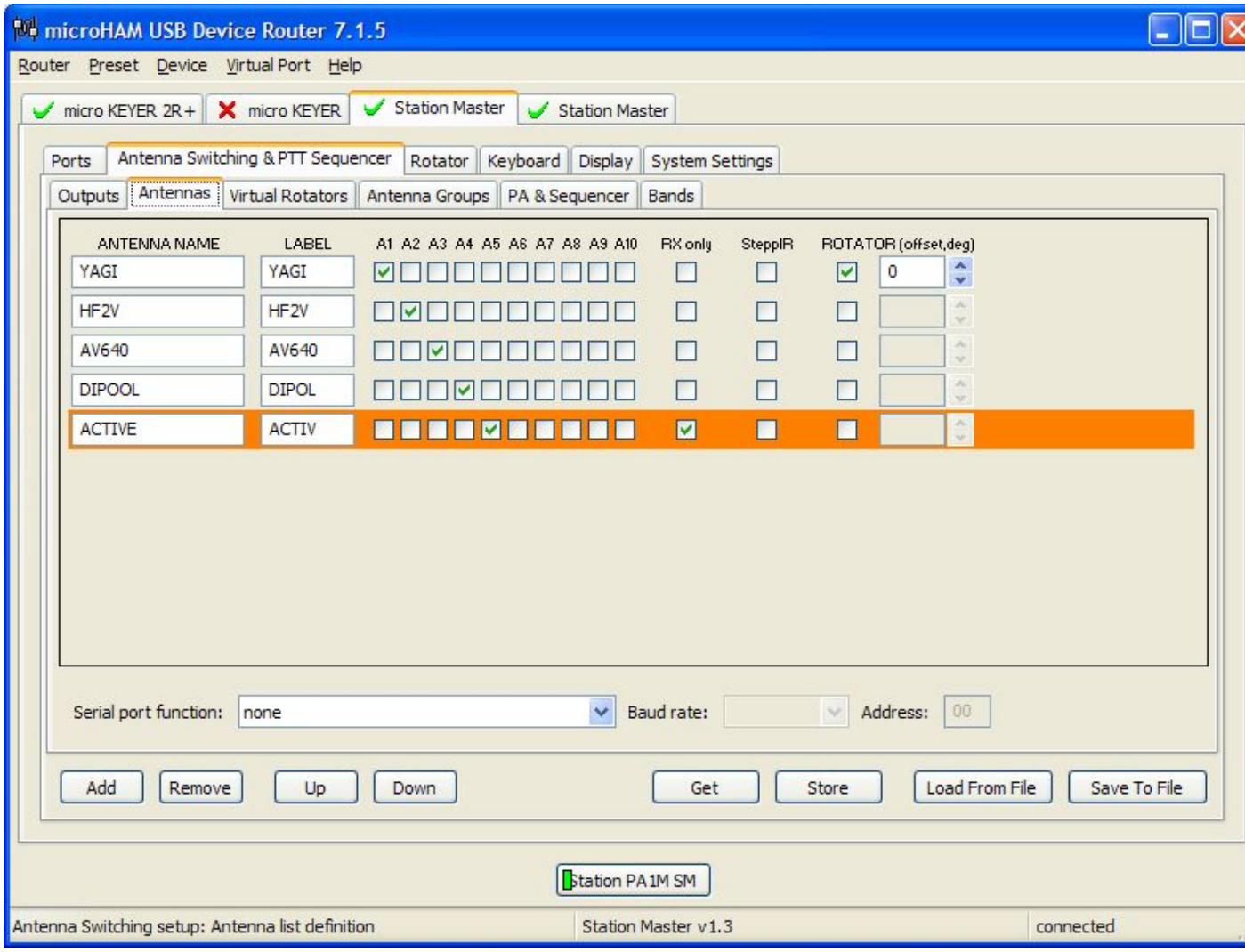

All settings (CAT, Rotator, Control etc.) None
iLINK couple Station Master Radio 1 − micro KEYER 2R+ (RADIO 1)

## Tab: Antenna Switching & PTT Sequencer
### Subtab: Outputs


microHAM USB Device Router 7.1.5
Router Preset Device Virtual Port Help
micro KEYER 2R+
micro KEYER
Station Master
Station Master
Ports
Antenna Switching & PTT Sequencer
Rotator
Keyboard
Display
System Settings
Outputs
Antennas
Virtual Rotators
Antenna Groups
PA & Sequencer
Bands
Select output dependency by its function:
ANT - Antenna selection dependent, i.e. remote antenna switch. Output is active whenever current antenna selection (single antenna, virtual rotator, or group) uses this output.
BPF - Band dependent, antenna selection and RX/TX state independent, i.e. switchable multiband BPF. Output is active whenever current frequency belongs to defined band, regardless of current antenna selection and/or transceiver RX/TX state.
SEQ - Band and RX/TX state dependent, antenna selection independent, i.e. sequenced ON/OFF switching for RX preamplifier. Output is active whenever transceiver is in TX state AND using of output is enabled on the current band.
A1 ANT B1 BPF
A2 ANT B2 BPF
A3 ANT B3 BPF
A4 ANT B4 BPF
A5 ANT B5 BPF
A6 ANT B6 BPF
A7 ANT B7 SEQ
A8 ANT B8 SEQ
A9 ANT B9 SEQ
A10 ANT B10 SEQ
Add
Remove
Up
Down
Get
Store
Load From File
Save To File
Station PA1M SM
Antenna Switching setup: Outputs definition
Station Master v1.3
connected

Default settings

## Tab: Antenna Switching & PTT Sequencer
### Subtab: Antennas




Enter antennas as connected to the TWO by TEN SWITCH.
A1 is port 1, A2 is port 2 etc.
RX only − this antenna is not for tranmitting
SteppIR − when it;s a SteppIR (not available here)
Rotator − if the rotator controller in the SM is turning this antenna
Offset − if the rotator has an offset

## Tab: Antenna Switching & PTT Sequencer Subtab: Virtual Rotators

Empty

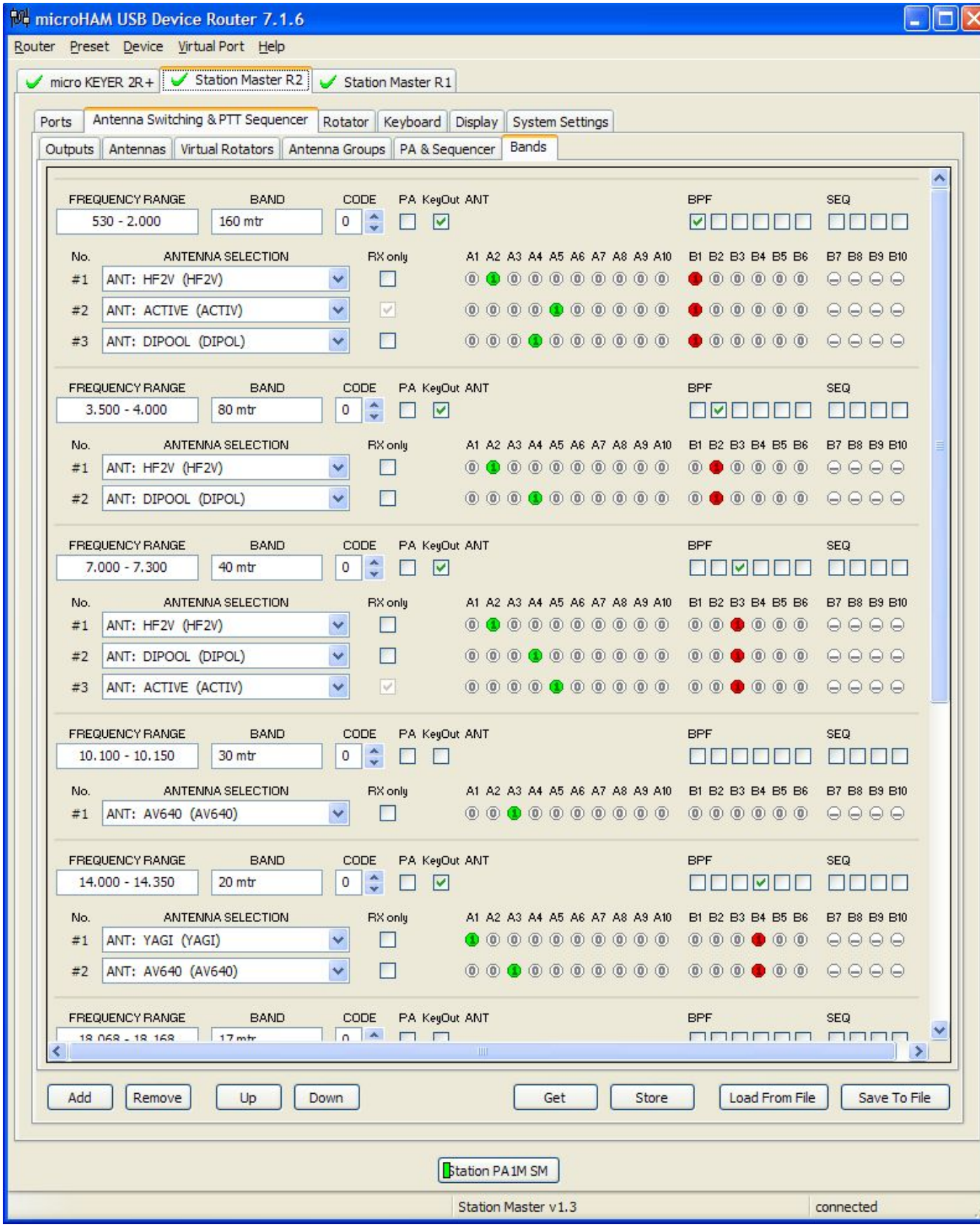
## Tab: Antenna Switching & PTT Sequencer Subtab: Antenna Groups

Empty

## Tab: Antenna Switching & PTT Sequencer Subtab: PA & Sequencer

No settings yet

# Tab: Antenna Switching & PTT Sequencer
## Subtab: Bands




Enter antennas as connected to the TWO by TEN SWITCH.
A1 is port 1, A2 is port 2 etc.

STORE the information to the Station Master. Otherwise NOTHING will change in the Station Master.

## Tab: Rotator

...

## Tab: Keyboard

Not in use yet

## Tab: Display

For now the default settings are being used..

## Tab: System Settings

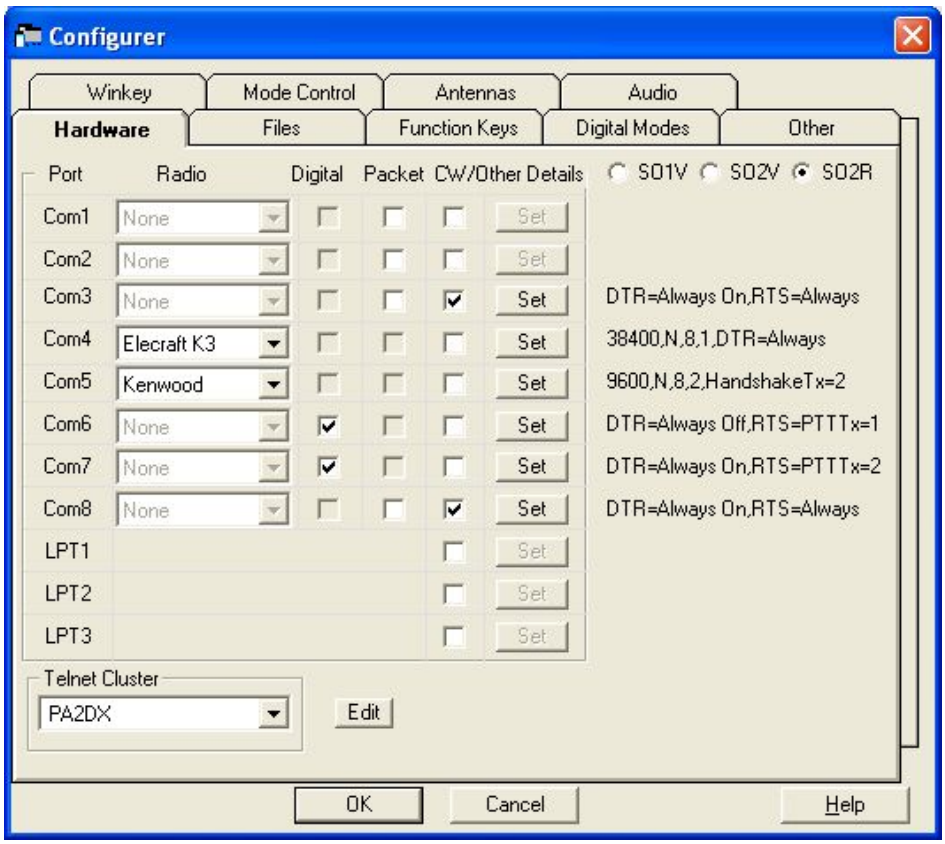
Not in use as the function keys in N1MM logger control the Voice messages.

## 2.6 N1MM logger setup

There s nothing magical about which ports are used for which purposes; you just have to be consistent between N1MM Logger and the MicroHam Router.

- Click Config| Configure Ports, Telnet Addresses, Other ...
- **Hardware Tab**

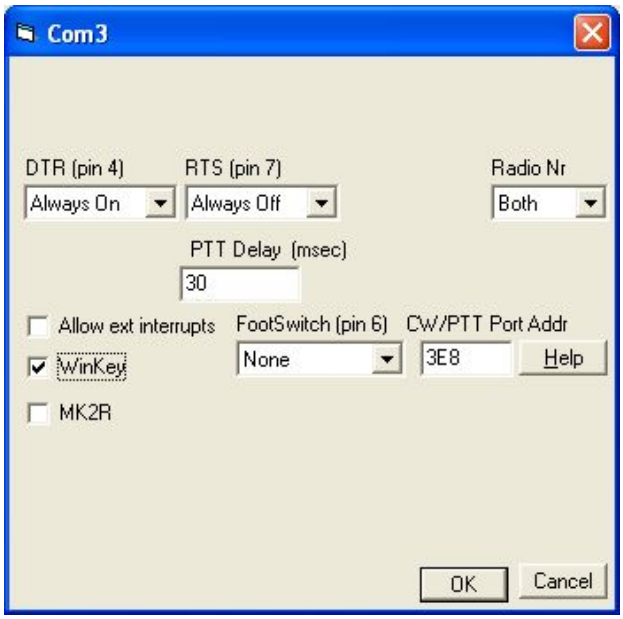
**PA1M Hardware Tab**



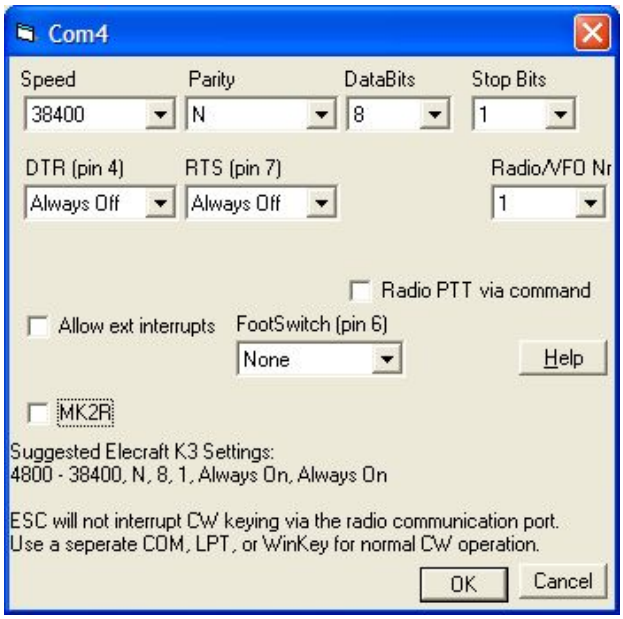

**Select: SO2R and Digital for Com6 and Com7**

It is not necessary to check CW/Other on the "Digital" ports. PTT will function even if "Other" is not checked.
COM3 to COM7 − set any unused handshake line (e.g., DTR) "Always Off" to prevent unwanted transmission if something is not configured correctly.

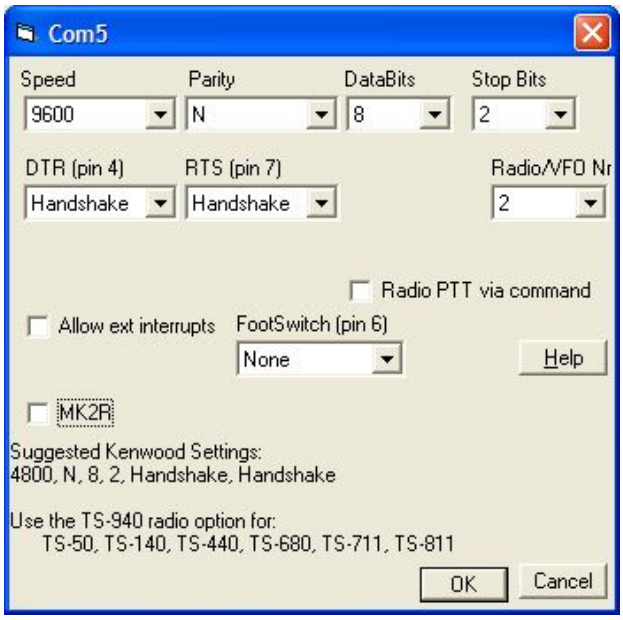
**COM 3 –** Winkey port



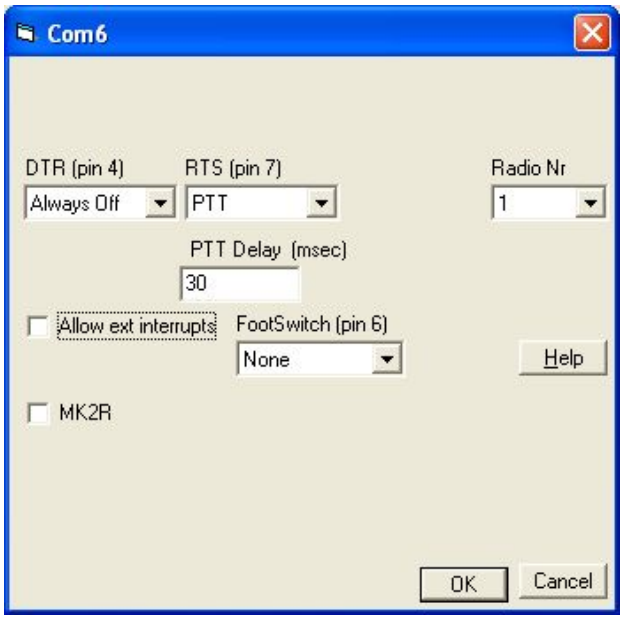

**COM 4 –**Radio 1: Elecraft K3




**COM 5 –** Radio **2**: Kenwood TS−2000

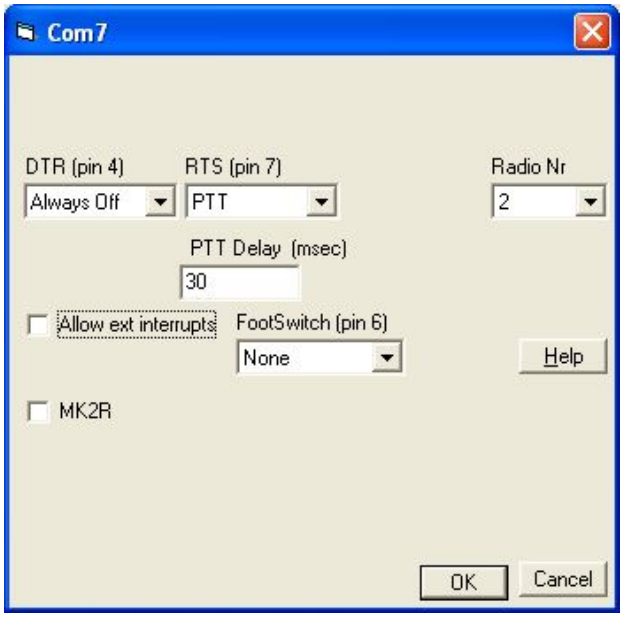


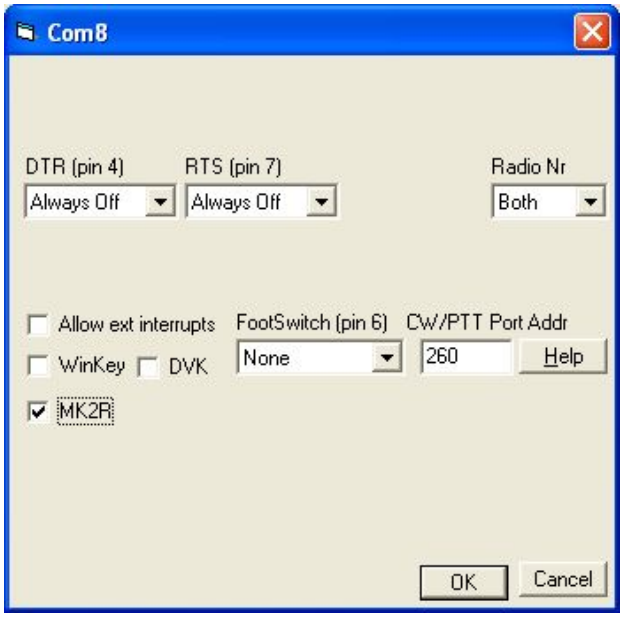

**COM 6 –**Radio 1: PTT DTR+footswitch




**COM 7 –**Radio 2: PTT DTR+footswitch Always On????

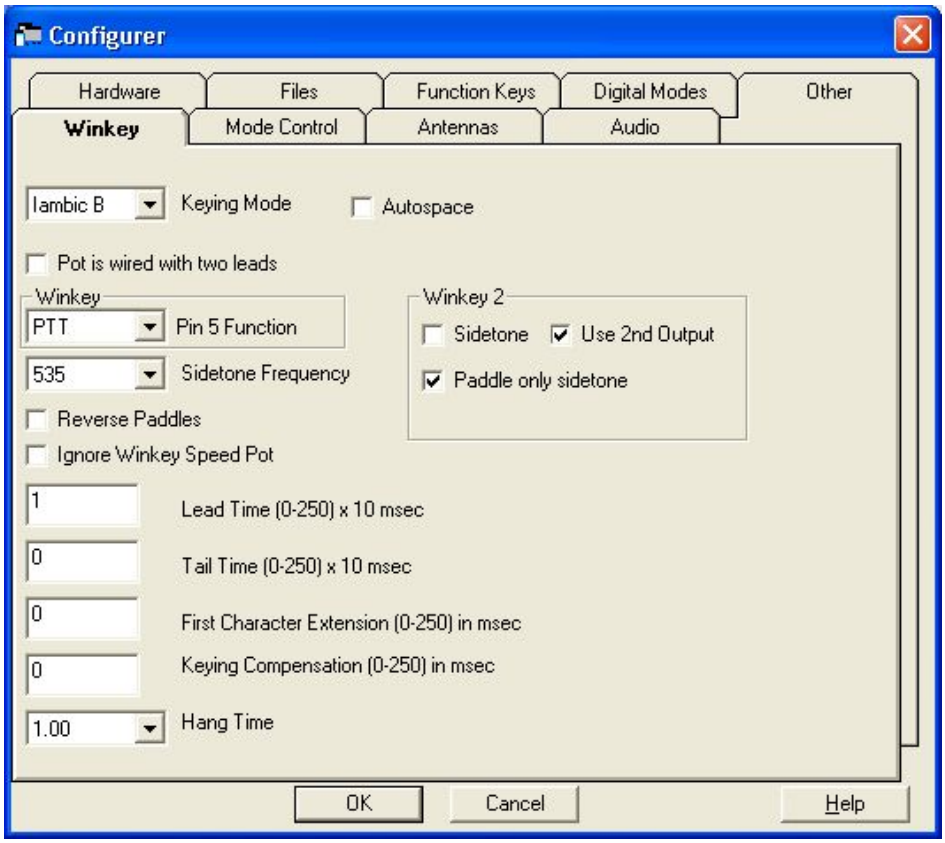
**COM 8 –** MK2R+ control port



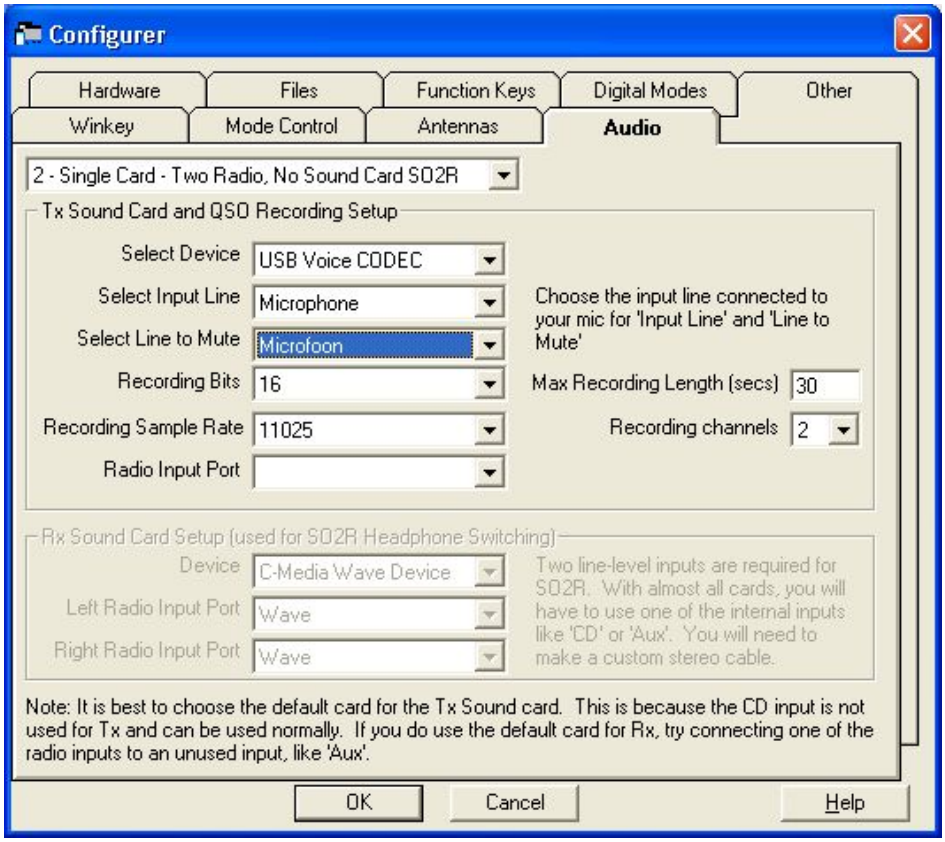

- **Digital Modes Tab**
  - Select **Soundcard** as the TU Type
  - Select **FSK** as the mode.
  - Enter the path to <u>each</u> MMTTY installation.

- **Winkey Tab**
  - **Use 2nd Output** should be <u>checked</u>. This allows normal switching of WinKey2 output.
  - **Pin 5 Function** should be **PTT** (unless you are using QSK)



- **Mode Tab**
  - **Contest specific choices**
  - **SSB/CW operation**
    - Mode recorded in log
      - ??????
    - Mode sent to radio
      - Follow mode recorded in log
      - Log mode/Radio mode: ??????
  - **RTTY operation**
    - Mode recorded in log
      - Always: RTTY
    - Mode sent to radio
      - Follow mode recorded in log
      - Log mode/Radio mode: RTTY to LSB

- **Audio Tab**
  - 2 − Single Card − Two Radio, No Sound Card SO2R
    - Select Device is: **USB Voice CODEC or Default?????**
    - Select Input Line: **Microphone**
    - Select Line to Mute: **Microphone**
    - Recording Bits: **16**
    - Sample Rate: **11025**
    - Radio Input Port: **<blank>** Radio Input Port should be blank!
      - If not blank, select another 'Select Device' and switch back to the USB Voice CODEC. Now it is blank.


Configurer
Hardware
Files
Function Keys
Digital Modes
Other
Winkey
Mode Control
Antennas
Audio
2 - Single Card - Two Radio, No Sound Card SO2R
Tx Sound Card and QSO Recording Setup
Select Device
USB Voice CODEC
Select Input Line
Microphone
Select Line to Mute
Microfoon
Choose the input line connected to your mic for 'Input Line' and 'Line to Mute'
Recording Bits
16
Max Recording Length (secs)
30
Recording Sample Rate
11025
Recording channels
2
Radio Input Port
Rx Sound Card Setup (used for SO2R Headphone Switching)
Device
C-Media Wave Device
Left Radio Input Port
Wave
Right Radio Input Port
Wave
Two line-level inputs are required for SO2R. With almost all cards, you will have to use one of the internal inputs like 'CD' or 'Aux'. You will need to make a custom stereo cable.
Note: It is best to choose the default card for the Tx Sound card. This is because the CD input is not used for Tx and can be used normally. If you do use the default card for Rx, try connecting one of the radio inputs to an unused input, like 'Aux'.
OK
Cancel
Help

NB.Leave TX Soundcard set for "**USB Voice CODEC**" with **Input Line set to Microphone** and **Line to Mute set to anything EXCEPT WAVE**. **Do not mute Wave!!** and do not select the option with 2 soundcards (5$ So2R).

**It is not necessary to change CODEC when running Digital modes.** The N1MM Logger "Audio" tab only effects the DVK sound card. The RX soundcard settings are used only if you have selected "Dual Cards − Two Radio, Sound Card SO2R" (= $5 SO2R).

All of the sound card selection for Digital operation happens in N2AMG's Digital Interface code. It is through the DI that one selects the soundcard to use for MMTTY and/or MMVARI.

## Filter setup (bandmap button)

Right click in bandmap and select "Set transceiver filter codes". Make a choice:
The kenwood settings are the default in N1MM logger.
The K3 has te be set up using K31;FWxxxx;K30; where "xxxx" is the desired bandwidth divided by 10.

| Filter setting | Elecraft K3 | | Kenwood TS2000 | |
|---|---|---|---|---|
| CW Wide | 800 Hz | K31;FW0080;K30; | ? Hz | FL007007; |
| CW Narrow | 400 Hz | K31;FW0040;K30; | Hz | FL009009; |
| SSB Wide | 2,8 kHz | K31;FW0280;K30; | | FL007007; |
| SSB Narrow | 2,1 kHz | K31;FW0210;K30; | | FL010007; |
| DIGI Wide | 400 Hz | K31;FW0040;K30; | | FL007007; |
| DIGI Narrow | 300 Hz | K31;FW0030;K30; | | FL009009; |

## Function keys

Not only messages can be placed into Function keys but also commands can be sent to the radio using macros.
Example: {CAT1ASC cmd } or {CAT1HEX cmd } The number 1 is the Radio which can be 1 or 2. Cmd is the command to the radio.

| Radio | Command | Action |
|---|---|---|
| Elecraft K3 | {CAT1ASC K31;PC120;K30;} | Set radio to 120 Watts |
| Elecraft K3 | {CAT1ASC K31;PC010;MD5;K30;} | Set to 10 Watts and mode AM.<br>Used to tune automatic tuner using low power. |

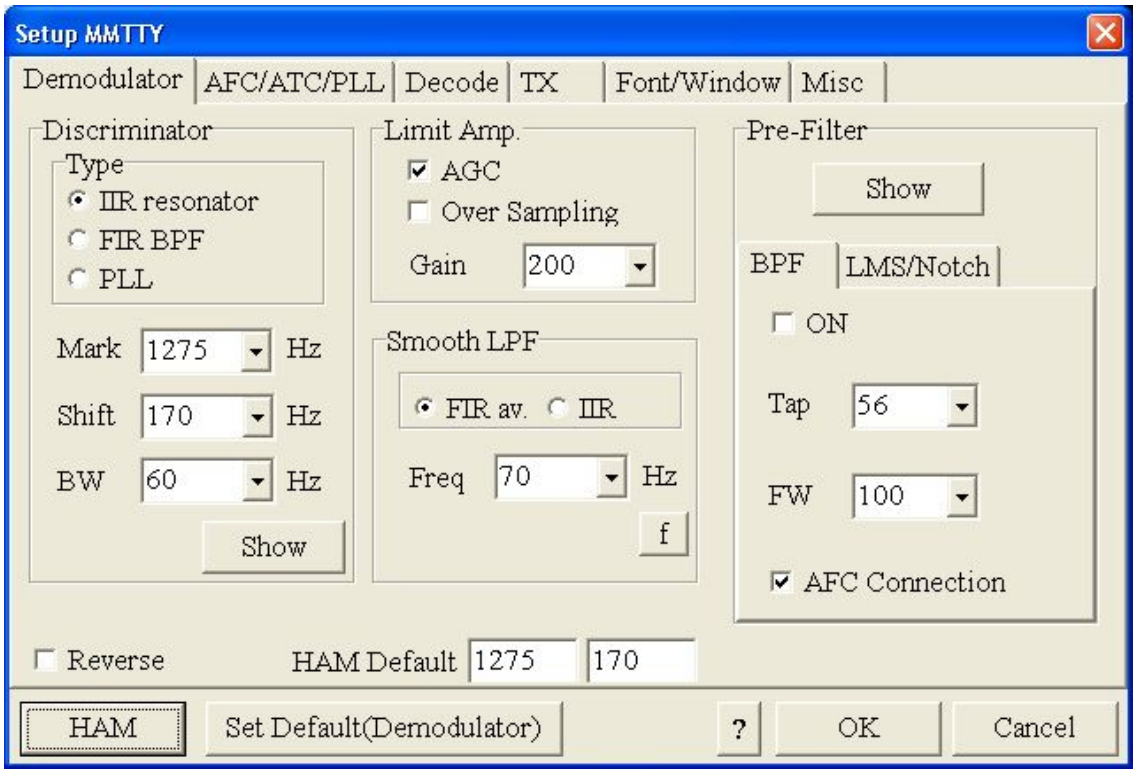
Elecraft K3: Check the K3 Programmers reference for all possible commands.
You can easily experiment with the filter codes using the {CAT* program macros.

## 2.7 MMTTY setup

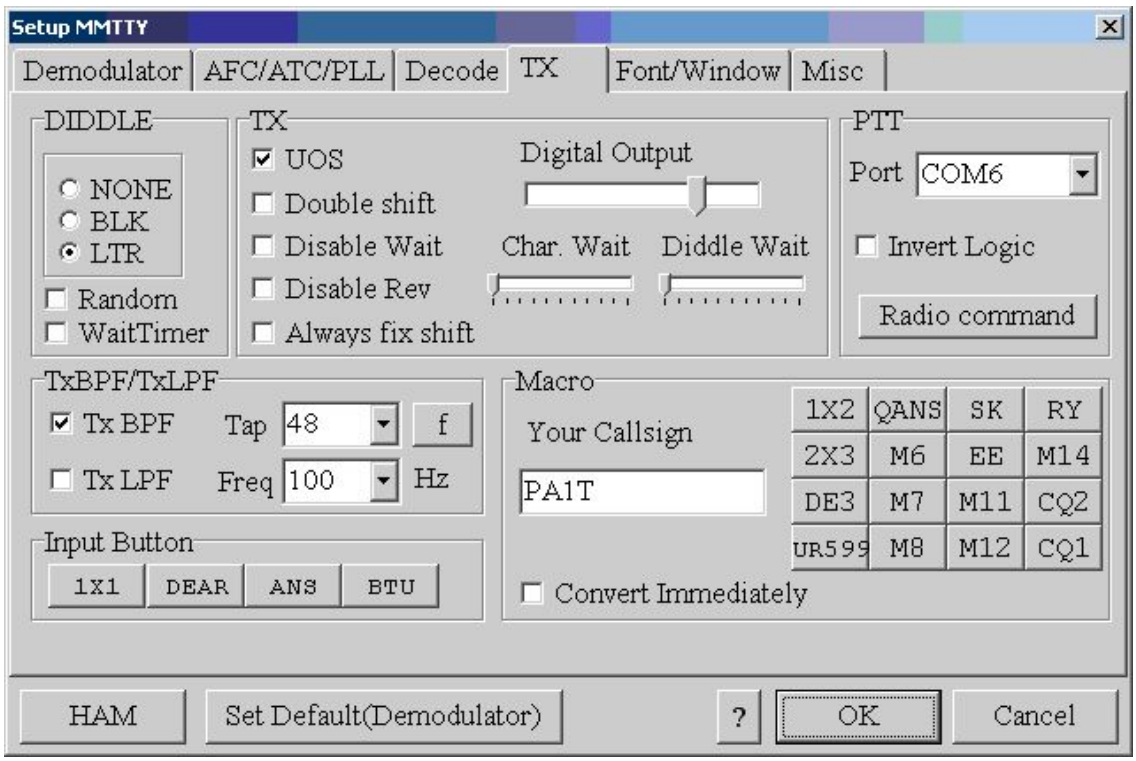
For RTTY contesting N1MM permits using the MMTTY Engine, MMVARI and/or an external TNC.

This configuration is based on using **MMTTY for FSK** and **MMVARI for PSK**.

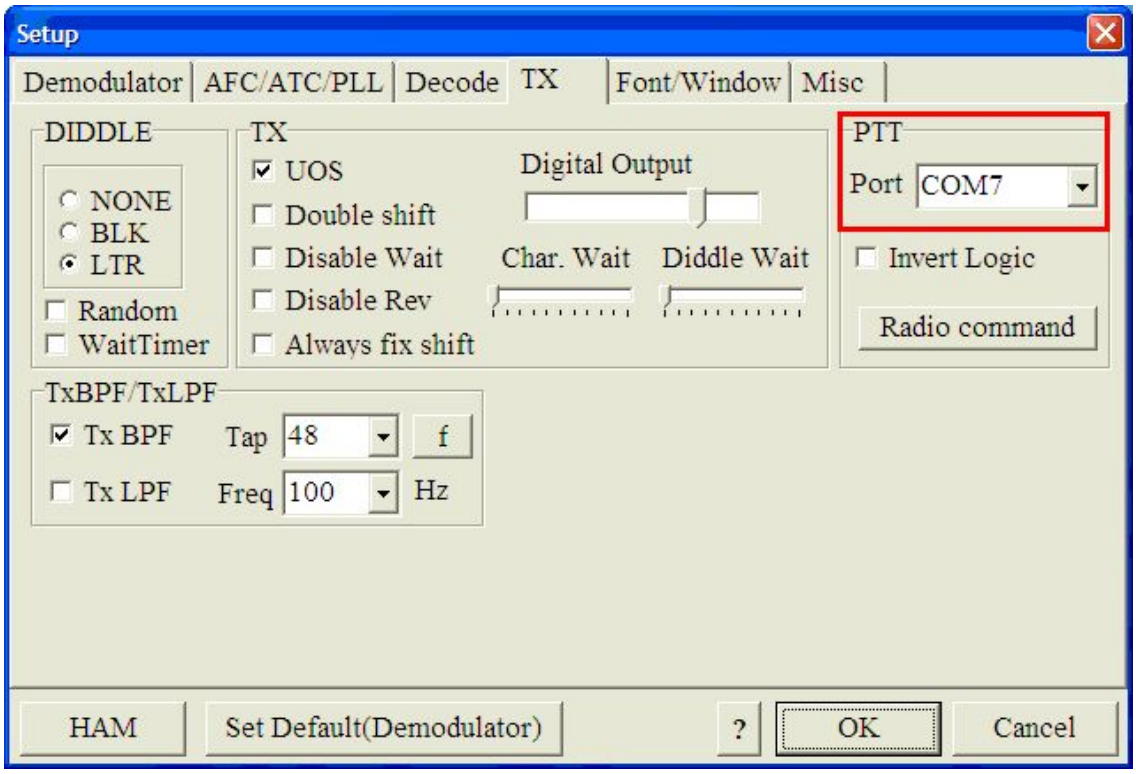
- Install MMTTY in TWO different directories on your hard disk.
- Run both instances of MMTTY.
- Click **Setup | Setup MMTTY**
- Choose the **Demodulator Tab**
  - Discriminator Type: IIR resonator
  - Change and setup Ham Default
    - Ham Default: 915 170 (Normal: Ham Default: 1275 170 (low tones): 1275 Hz (MARK) 1445 Hz (SPACE) 170 Shift)
    - Click: HAM
    - Click: OK



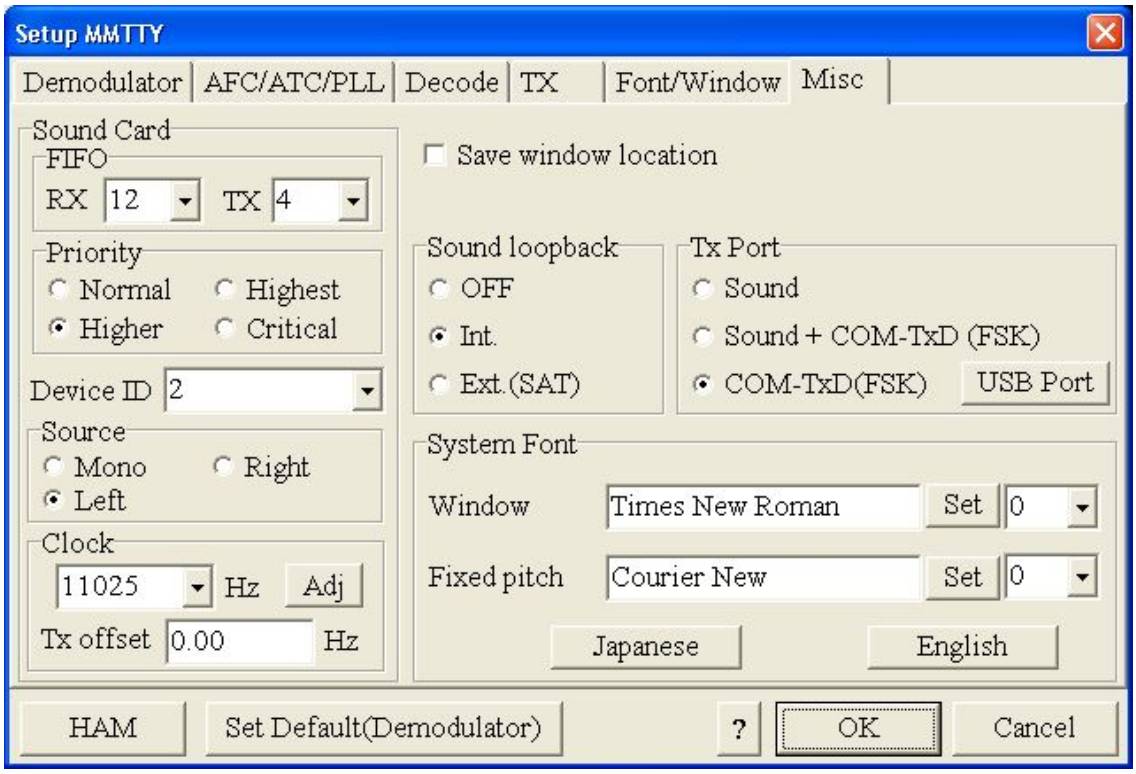

- Choose the **TX Tab**
  - **First MMTTY:** assign PTT to the first Digital port (this is Radio_1) = **COM 6**



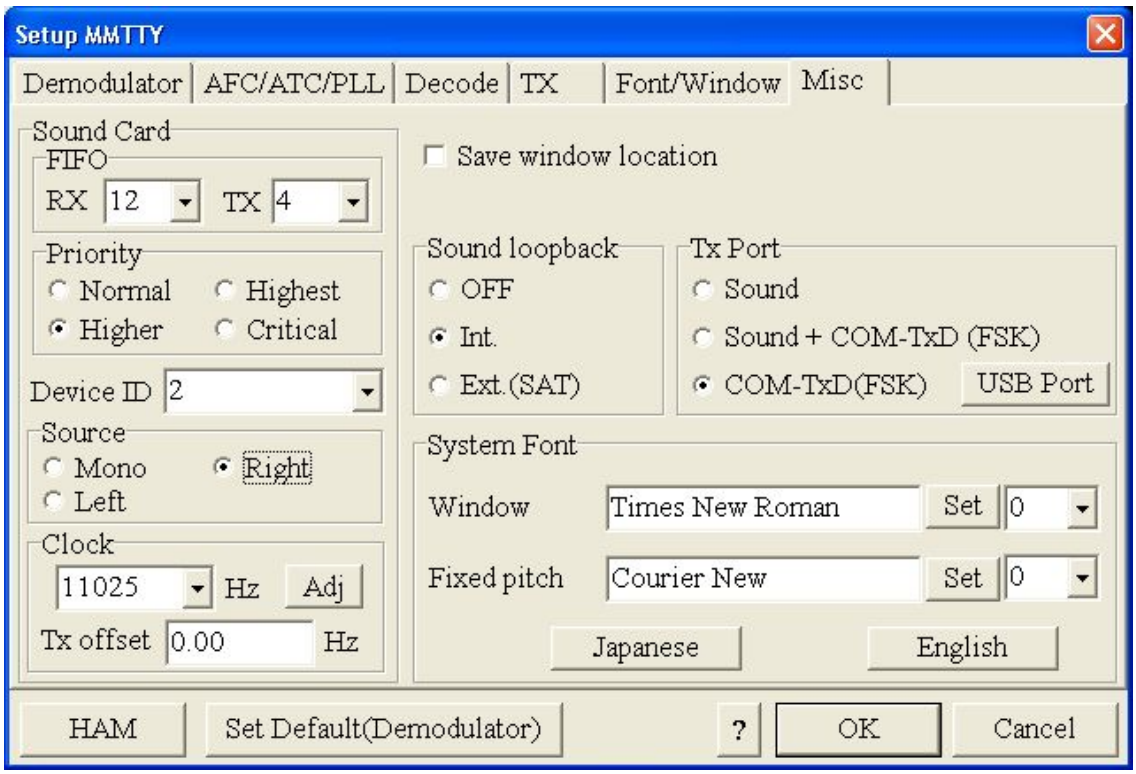

  - **Second MMTTY:** assign PTT to the second Digital port (this is Radio_2) = **COM 7**




- Choose the **Misc Tab**
  - **First MMTTY:** Select **Source Left**
  - **Second MMTTY:** Select **Source Right**
  - Select clock **11025**
  - Select proper Sound card Device ID number.
    - To obtain proper ID, click **Get ID button at Router Audio Mixer tab** for **USB Audio CODEC.**
    - **Device ID = 2**
  - Sourse
    - **First MMTTY: Left**
    - **Second MMTTY: Right**
  - Select COM−TxD (FSK) for the TX Port.
    - If you want the option to switch between AFSK and FSK, select Sound + COM−TxD (FSK)

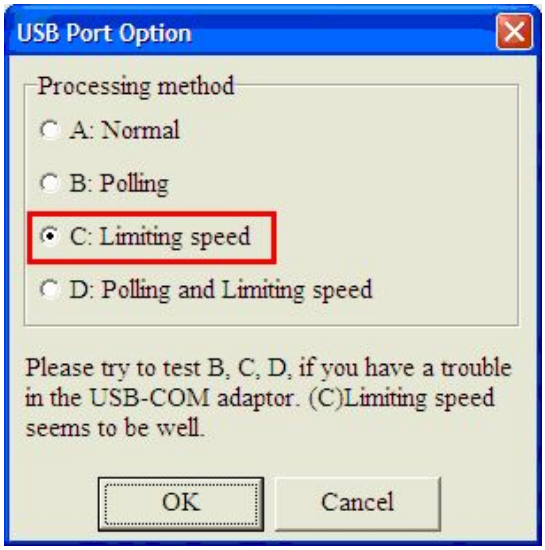



**First MMTTY**




**Second MMTTY**

- Click USB port button and choose C: Limiting speed


USB Port Option
Processing method
A: Normal
B: Polling
C: Limiting speed
D: Polling and Limiting speed
Please try to test B, C, D, if you have a trouble in the USB-COM adaptor. (C)Limiting speed seems to be well.
OK
Cancel

**Repeat** the configuration for the **Second Digital Interface** substituting the second virtual COM port and using **Source Right**

- Click **Menu | View**
  - Select: XYscope
  - XYscope Size: Big
  - XYscope Quality: Higher

## 2.8 PC setup

There is **NO** Realtek problem on my PC! This means that the Sound playback in Windows sound manager setting do not matter and the normal soundcard settings can be used. Select 'No sounds' on the Sounds tab, Windows sounds will not be transmitted on the air.

### 2.8.1 Computer USB port setup

Default Windows is turning off the USB port to save power.

Right click on "My Computer"
Select Properties
Select the "Hardware" tab then "Device Manager"
Expand Universal Serial Bus controllers
Double click on each USB Root Hub entry in turn.

When the USB Root Hub entry is open,
Select the Power Management tab and remote the Check mark from the "Allow the computer to turn off this device to save power" box.
Click OK

## 2.9 Errors and other problems

### 2.9.1 Station Master messages

Message: KEY IN TOO LONG
Solution: uRouter: Station Master  Tab: PA & Sequencer  Deselect Key In
Remember: Don't forget to reset Transmit focus on MK2R

### 2.9.2 K3

Error: K3 does TX but no FSK output
Solution: Check if radio is in FSK D (this is a setting per band!)

## 2.10 Detailed Cabling Diagrams

Breakout box from Station Master Ports

| DB25 to DOUBLE_TEN_SWITCH | StationMaster 1 − Port A | StationMaster 2 − Port A |
|---|---|---|
| 1 − PORT A1 | 20 − PORT A1 | |
| 2 − PORT A2 | 21 − PORT A2 | |
| 3 − PORT A3 | 22 − PORT A3 | |
| 4 − PORT A4 | 23 − PORT A4 | |
| 5 − PORT A5 | 24 − PORT A5 | |
| 6 − PORT A6 | 25 − PORT A6 | |
| 7 − PORT A7 | 10 − PORT A1 | |
| 8 − PORT A8 | 11 − PORT A1 | |
| 9 − PORT A9 | 12 − PORT A1 | |
| 10 − PORT A10 | 13 − PORT A1 | |
| 11 | | |
| 12 | | |
| 13 − Ground all Relays | 19 − Control Ground | |
| 14 − PORT B1 | | 20 − PORT A1 |
| 15 − PORT B2 | | 21 − PORT A2 |
| 16 − PORT B3 | | 22 − PORT A3 |
| 17 − PORT B4 | | 23 − PORT A4 |
| 18 − PORT B5 | | 24 − PORT A5 |
| 19 − PORT B6 | | 25 − PORT A6 |

| | |
|---|---|
| 20 − PORT B7 | 10 − PORT A7 |
| 21 − PORT B8 | 11 − PORT A8 |
| 22 − PORT B9 | 12 − PORT A9 |
| 23 − PORT B10 | 13 − PORT A10 |
| 24 | |
| 25− Ground all Relays | 19 − Control Ground |

# 3 N1MM − RTTY operation / settings

- **N1MM logger Configurer − Mode Tab**
  - ♦ **Contest specific choices**
  - ♦ Mode recorded in log
    - ◊ Always: RTTY
  - ♦ Mode sent to radio
    - ◊ Follow mode recorded in log
    - ◊ Log mode/Radio mode: RTTY to LSB

**DI 1 Menu: Settings**
Tab: General/MMTTY Setup

- Enable: Add Callsign to Bandmap on Alt−G
- Enable: Send Space on Callsign Mouse Click
- Disable: Send HamDefault on Run to S&P change
- Enable: Turn AFC Off when switching to S&P
- Select: Small MMTTY window
- Select: Always on Top

**DI 1 Menu: Settings**
Tab: Macro Setup

- Setup extra keys when needed
- Digital Macro Setup: SoundCardRTTY
- # of Macros: Select 8,16 or 24
- Fill in contents for macros

**DI 1 Menu**

- Disable: AFC On/Off with CQ
- Enable: NET On/Off with Run Change
- Enable: Auto Update TRX Offset w/Mark Freq.
- Right click menu: Select Output to text file

**Entry Window − Function Keys**

- Setup Function keys for the specific contest

## 3.1 MMTTY setup

### 3.1.1 Configure it to use the EU1SA profile

EU1SA's profile uses an IIR demodulator like the Standard RTTY profile, but with sharper filters (which increases the CPU load).
I've uploaded a USERPARA.INI file that includes the "EU1SA" profile along with "Standard RTTY", "Fluttered Signals", "Fluttered Signals (FIR)", "23Hz RTTY", and "MultiPath" to:
www.dxlabsuite.com/winwarbler/Profiles/UserPara.ini
If you've created new profiles or modified the existing profiles, then save your current UserPara.ini file before replacing it with the above. Then start MMTTY, open the Profiles menu, and choose EU1SA. You can define up to 8 profiles in UserPara.ini, so you can replace the one's you don't like with ones you've developed or modified.
Documentation for the parameters that can be set in a profile is available via:
www.dxlabsuite.com/winwarbler/Profiles/UserPara.doc
A spreadsheet comparing each of the profiles (including EU1SA) to the "Standard RTTY" profile is available via:
www.dxlabsuite.com/winwarbler/Profiles/Profiles.xls
73, Dave, AA6YQ

As I am quite familiar with the profile (see my signature), let me add a couple of words to the discussion.
The "EU1SA" profile is mostly not about decoding, but first of all, it's about extra filtering. It makes the

MMTTY RX bandwith exactly matching the RTTY signal. The brickwall DSP filter with sharp skirts cuts everything off but the desired signal. It is clearly seen at the tuning indicator. With such a set up you can even use wide SSB filters and still have pretty nice results overall. Obviously if you use other filters, as well, it makes the overall selectivity even better.
Yet another positive aspect of that is the tuning easiness. It comes from the fact that only one and only signal matches the bandwith. The moment you tuned to a station, the signal is already readable/decodable and you only need a bit of fine tuning, if any.
As you can see, this profile is mostly just another contesting tool. It helps quick tuning and easy decoding regardless adjucent QRM. And still, it provides the decoder with a narrower bandwith to process, virtually one signal a time.

73, Vladimir VE3IAE aka EU1SA

## 3.2 N1MM logger − RTTY − Operating the contest

While in S&P leave the NET button pressed if you are running deselect it.
AFC I usually leave off and tune by hand. During a contest the bands are usually to crowded. The AFC is always trying to move and grab something you don't want it to.

- AFC off during crowded contests (Disable: AFC On/Off with CQ)
- NET on during S&P, off during Running (Enable: NET On/Off with Run Change)
- To get bandmap/spot freq. correct (Enable: Auto Update TRX Offset w/Mark Freq.)

- Alt+T − Toggle TX/RX, the cursor will be set to the TX window of the active interface.
- Alt+G − Grab callsign.

**In N1MM**
You will probably want the larger MMTTY window checked. If you use the small window you do not have access to the MMTTY settings or the buttons.. Make sure you have whatever port that is going to be used for PTT has the digital checkmark next to it..

## 3.3 QSO making tips with N1MM logger

During the contest the contest infoirmation like callsigns, exchanges are showing in the Digital Interface (DI. This information has to be brought to the Entry window and split out over Callsign filed and the exchange fields. Also transmissions have to be made. In Digital modes the normal behavior as used in CW (using the insert key) and SSB (just type it in) can be used. There are some extra possibilities in Digital modes which can be used (Callsign box in DI and GRAB button, additional macros and hover mode in combination with the right click mouse button).

### 3.3.1 Using Hover mode:

- With hover mode when you hold the mouse over a valid call sign it places the callsign in callsign filed in the Entry Window. Where this works in use with 'Right click send Enter' is you hover over the call then right click to plant the call and send your call when the station comes back to you you click on the exchange to place it in Entry Window. Right click again send TU and logs the Q. Right click, left click,right click and your done...
    - Note: Your own call is excluded from being picked up.
    - Hover mode is used in conjunction with the menu selection 'Rt Click = Return NOT menur' which will will send a Return when right clicking in the DI RX window instead of displaying a pop up menu

### 3.3.2 The rate improver − Right Click = Enter not menu"

Selectifrom the settings menu in the Digital window "Right Click = Enter not menu". When not using this setting then you need to give it a try. It could improve your rate greatly as your hand never leaves the mouse except for the occasional difficult exchange. And your eye do not have to move far from the Digital window either. Making a qso means:

- While in Run mode
    - ♦ Right click in the DI's RX window it sends CQ
    - ♦ When a station replies left click on the call
    - ♦ Right click sends your exchange
    - ♦ As he sends his exchange left click on it
    - ♦ Right click again to send TU and log the call
    - ♦ Right click again starts CQ (and your back at the first bullet)

- In S&P it does the same thing as hitting enter to advance thru the ESM mode.

The right click takes the place of hitting 'Enter' for the ESM. Most of the time while in the contest I have one hand on the mouse and the other hand I have one finger resting on the space between the Esc and F1 keys. With that finger I can hit Esc if I have started a CQ and someone has started coming back to me. 73' Rick PA2AMG

## 3.4 Do you have... (what to check when it does not work)

Below the most common mistakes made setting up or using N1MM logger in RTTY mode.

- Add {TX} and {RX} to each of the F Keys...
- Set up "always RTTY" in the Configurer under the Tab: Mode Control
- Select the DI type in the Configurer under the Tab: Digital Modes
- When MMTTY selected: Set up the path to MMTTY in the Configurer under the Tab: Digital Modes

## 3.5 How to setup RTTY (by Rich VE3KI)

Another great answer from Rich to a question from a RTTY newbie. Tnx. Thomas

What I use is below − it's a pretty standard set for the most part. I have to confess I haven't really tried out the F12 messages − getting two answers to a single CQ from my home station is almost unheard−of.

I try whenever possible to transfer information into the Entry window by clicking on it in the Digital Interface window. That eliminates all sorts of typing errors, as well as making it unnecessary to use the keyboard for simple QSOs with good copy.

There are a couple of other things that really help. One is to use ESM. The Enter key (I use the one in the keypad − it's right beside the mouse) does almost everything. In fact, most of the time that's the only key I touch on the keyboard. Almost everything else can be done using the mouse. For example, the function keys can be sent by clicking on the appropriate button in the Entry window.

There is one other key that comes in handy, and that's the Esc key for when you bollix things up and send the wrong message − hit Esc to abort the mistaken message and then click on the correct button.

In the Digital Interface window, there is an option (under Setup) for Rt Click = Return NOT menu. If you use this with ESM, you don't even need to press the Enter key, you can just right−click in the DI receive window. The downside is that you lose access to the right−click menu items in the receive window. You don't need these very often, though, so it's not much of a loss.

In the DI Setup −> Settings window, you might play around with using the Send Space on Callsign Mouse Click. This is a bit like the big gun/little pistol option in the main Configurer (ESM only sends your call once etc.).

The macro buttons you can get under the Macro Setup tab in the Settings window are very useful. I select the SoundcardRTTY macro set and have it set to display 24 macro buttons. That gives you up to 24 mouse−clickable buttons in the DI window that you can program to hold all kinds of extra messages (short CQs, long CQs, short exchanges, long exchanges, short calls, long calls, questions, answers, you name it...). Every now and then I still end up typing free−form into the transmit window, but with a good collection of spare buttons in the DI window that turns out to be quite rare.

Even when I am using AFSK I operate FSK−style, i.e. doing all my tuning with the radio, never with the mouse − I just watch MMTTY's crossed ellipses and turn the tuning knob to fine−tune. That makes it feasible for me to open the second DI window as an alternate decoder. I have it set to use MMVARI instead of MMTTY, set its decoding frequency on my centre frequency, and use it to give me a second opinion. You can single−click on call signs and exchanges in the second DI window provided you remember to click again in the DI1 window before clicking on a macro button, right−clicking or hitting Enter. I often even run a third receive−only decoder (MixW) off the same sound card. You can't click on info in this window; you have to type the info in the Entry window if this is the only window that copied it. Mostly I use this window as a check when the other two windows disagree. It's a bit surprising how often that happens.

This "use the mouse for everything" style is very different from CW, where you normally try to set things up so the mouse is never needed. It seems paradoxical that you try to operate RTTY (a keyboard mode) using the keyboard as little as possible, and CW (a manual mode) using only the keyboard − well, not quite − in CW I use a paddle for the kind of thing I program into the DI window macro buttons in RTTY.

Oh yes, function keys − I almost forgot:

F1 CQ,{TX} CQ TEST DE * * CQ {RX}{CLEARRIT}
F2 Exch,{TX} 599 04 ON ! {RX}
F3 TU,{TX} ! TU * CQ {RX}{CLEARRIT}
F4 {MYCALL},{TX} * {RX}
F5 His Call,{TX}{ENTER} ! {RX}
F6 B4,{TX} B4 DE * CQ{RX}{CLEARRIT}
F7 Rpt Exch,{TX} 04 04 ON ON {RX}
F8 Agn,{TX}{ENTER} AGN? {RX}
F9 ZN?,{TX}{ENTER} ZONE? {RX}
F10 ST?,{TX}{ENTER} STATE? {RX}
F11 Wipe,{WIPE}
F12 Stack,{TX}{ENTER} {CALL} {LOGTHENGRAB} TU NW {F5}{F2}{RX}
F1 CQ,{TX} CQ TEST * * CQ {RX}{CLEARRIT}
F2 Exch,{TX}{ENTER} ! TU 599 04 04 ON ON * {RX}
F3 TU,{TX} {CALL} TU {RX}
F4 Call Him,{TX} DE * * {RX}
F5 His Call,{TX} ! {RX}
F6 0x1,{TX} * {RX}
F7 Rpt Exch,{TX}{ENTER} 04 04 04 ON ON ON {RX}
F8 Agn,{TX}{ENTER} AGN? {RX}
F9 ZN,{TX}{ENTER} 04 04 04 {RX}
F10 ST,{TX}{ENTER} ON ON ON {RX}
F11 Wipe,{WIPE}
F12 Grab,{GRAB}

73, Rich VE3KI

## 3.6 Best exchange format

The best format is 599 001,with a space separating the two parts of the exchange and without any hyphens.
The reason is a bit technical, but basically RTTY as used by hams has a built in function called UnShift On Space, or USOS. USOS provides a means for resetting the state of the FIGS or LTRS shift if they should get messed up due to QRM, QRN, QSB or whatever. When USOS is on, every time the transmitter sends a space, it resets itself to the LTRS state, and every time the receiver receives a space, it does the same. I won't bore you with the details (unless you ask), but that greatly increases your chance of copying correctly. Using a hyphen, such as 599−001 defeats USOS because there is no space. Some contesters use the hyphen intentionally because it does speed up the transmission, but most experienced contesters have decided to trade the speedup for more reliable copy.

In any event, please don't run things together like 599001. That causes the receiving station to have

to manually enter the exchange instead of just clicking on it.

By Bill, W6WRT

## 3.7 Welcome to RTTY Contesting

RTTY is becoming very popular on the HF bands. Many hams, both old timers and new comers, have gotten RTTY working and made QSOs. Now they are trying RTTY contesting. We, and other RTTY contesters, have noticed that some RTTY new comers are unaware of efficient contest exchanges or have picked up a few bad habits. After each RTTY contest there are email discussions about ineffective (i.e. time consuming) exchanges.

While the newer RTTY contester may be using the contest as a mean towards RTTY WAS or RTTY DXCC, most of the RTTY contest operators are trying to make as many QSO in the time allotted. Sending anything but the minimum, required contest exchange slows them down.

To provide guidance, VE2FK wrote an excellent guideline and posted on the RTTY contest reflector. The following is our updated guidelines:

These operating tips are from the very best operators. This information has been collected from several RTTY sites in order to standardize contest operations on the air.

1. Message buffers should have a carriage return (ENTER) at the beginning and only a space at the end. Following this practice really helps pick out sent information such as a call sign or the contest exchange.
2. Start your CQ with the contest name and end it with CQ ex: BARTG DE Mycall Mycall CQ.This way, a station tuning in midway of your CQ will know you are not calling another station, but CQ'ing.
3. Use spaces to separate your numbers, ex: 599 001 001. There is no real reason to use hyphens. Do not use periods, commas, slant bars. In RTTY it is preferable to send the 3 digits, it's easier to click on 001 than 1. In normal conditions the exchange is sent twice but the RST only once. In poor conditions exchange may be sent 3 times, ex: 599 001 001 001. For contests that require a State or Province send the RST once and the State or Province twice, ex: 599 QC QC.
4. Do not use 5NN in RTTY, use numbers, ex. 599. RST is sent only once and not repeated if exchange is sent again. Read the rules, if the RST is not required, don't sent it.
5. Do not use abbreviation like: PSE, IN, HR IN, NR, PLEASE COPY, RST, BK, KN, PSE, QSL?, SK etc. Keep the transmission short and limited to just the essential information needed for the contest exchange.
6. It is important to have macros to ask for (or repeat) specific information instead of asking for an entire repeat or sending an entire repeat of an exchange. Repeating the entire exchange when only one piece of information is needed is a waste of time.Also, have macros ready for special situation, ex: SRI QRG QRL,SRI YOU ARE OFF FREQ, SRI NO QSY, SRI NO COPY CUL, etc.
7. If you are in RUN mode (CQing), reply with (Hiscall) the exchange (Hiscall). If there are many callers or QRM, it is important to confirm to whom you have sent the exchange. ex: Hiscall 599 001 001 Hiscall.Then, confirm with (TU Hiscall de Mycall CQ) to continue.
8. If you are in the S&P (Search and Pounce) mode never send your exchange to the CQ'ing station until he has acknowledged your call and sent his exchange first! Don't send Hiscall but only Mycall, ex: DE Mycall Mycall, then reply with only your exchange, ex: TU 599 002 002. (TU says it all: QSL, TU, 73) The DE can be omitted.
9. Do not use (NAME) while in S&P mode.In RUN MODE, it's your choice to use it or not.
10. Put the word RTTY in the comment field of DX spots.
11. Be on frequency, know how and when to use AFC and NET options in the software or don't use them.

If you are new to contesting, remember that the top guns are out to make as many QSOs per minute as possible. Following the above hints will not slow them down. They will be anxious to work you on another band and in the next contest.

One of the best WEB Sites to get info is : www.rttycontesting.com. It is also a good idea to be a member of the RTTY reflector. You can subscribe at: http://lists.contesting.com/mailman/listinfo/rtty

Good luck in the RTTY contests!

## 3.8 Starting in September

This first part of the big 3 part CQWW fall contest is coming soon.

CQWW RTTY occurs the last weekend in September. It is an excellent chance to test out antennas, radios, amps, and other station changes made over the summer. It is also an excellent way to learn, or brush up on, SO2R or other logging program features since you don't have to concentrate as much on copying the exchanges and calls. You can pay attention to the computer and the mechanics of your operating rather than worrying about making copying mistakes yourself.

I look at RTTY contesting a lot like CW contesting, but quieter. While it is useful to listen to the received signal to make timing exchanges go smoother, you don't have to listen to most of the qrm and other noise, you are just listening for the other guy to stop transmitting so you can start. Also, with modern loggers, and more contesters realizing that RTTY is gaining popularity, the pace of RTTY contesting is picking up. It wasn't long ago that a typical exchange was repeated several times, extra 'hello' and 'thanks' and brag stuff was added which slowed things down... now I think most operators have figured out that rates well over 100/hr are very possible if you cut out the chit chat and use exchanges like in CW contests with just a few simple modifications.

And don't think that it takes lots of extra hardware of special stuff to get into RTTY contesting. If you are using a logger like N1MM and have hooked up your sound card as a voice keyer you are likely just one cable away from RTTY operating. If you already have the computer playing audio to the radio, all you need is to get the radio audio to the computer. With an FT−1000mp, and probably many other radios, that can just be a single off the shelf cable from the line out−on the back of the radio to the sound card line−in. This lets you use the radio in SSB and send/receive AFSK. DON'T listen to the pundits that say you 'HAVE TO USE FSK' to do good! I have a wall full of plaques for winning North America, the USA, or the World, ALL done with AFSK, and NEVER a complaint about the signal. And all I had to add were 2 cables so I could use the narrow filters instead of SSB filters using the mp's 'PKT' mode. And 100% FREE software!

It also presents you with some interesting technical operating capabilities. With a single sound card it is possible to do SO2R and be decoding 2 bands at once, and not lose a beat decoding the 2nd radio while transmitting on the first. With 2 sound cards, or 2 computers with one card each, you can decode BOTH VFO's on 2 radios at once, so you can both CQ and S&P on 2 bands at once!! Talk about technique building!

CQWW RTTY has some very interesting operating features. First, it has a very interesting Multi−Single Low Power category. We ran that here and were able to win the World plaque a couple times, how many times has someone in the states won a World plaque in CW or SSB??? This category makes it nice for expeditions and other stations that don't have RTTY capable amps to do a multi−op without a lot of big amps.

Next, CQWW RTTY is a 'Work Everyone' contest... You get to work everyone, including stateside. Multipliers are states/provinces, countries, and zones... so your first stateside and Canadian on each band are TRIPLE multipliers! This adds to the activity and there are virtually no slow times, there is always someone out there to contact.

And as in most RTTY contests there is no 160m, so while that might be interesting if you have antenna changes there to test, at least you don't have to worry about the end of summer noise quite as much. This also means for M/S or M/2 entries you can spend more time on the productive 80m and 40m night time bands.

So keep in mind, CQWW REALLY starts in September! Hook up those sound cards and get on the air. Check out some of the digital contest reflectors and web sites for hints and suggestions. Join the N1MM−Digital reflector if you use that logger for all the up to date info (including a new update to MMTTY to make it work better with Vista!)

David Robbins K1TTT